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WILDLIFE IN NORTH CAROLINA

JANUARY, 1988 75 CENTS

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Brothers Of The Lodge

by Jim Dean

If you've ever wondered what happens to old National Geographics, Reader's Digests and sporting magazines, you need look no farther than a hunting or fishing lodge. A lodge or camp is the final resting place of every old magazine after it passes through a prolonged purgatory in some dentist's office, a lengthy limbo in a barber shop, and 40-odd years in an attic.

JACK DERMID

Most of us have spent some marvelously happy times in such camps, and it's amazing how similar they all are. Dark, knotty pine or varnished log walls are covered with old calendars of bird dogs on points or blondes selling auto parts. There are shirt-tails from missed deer, cute signs — "The worst day fishing is better than the best day working" — moldy mounted fish, moth-eaten whitetails, at least one "jackalope," and the worst collection of outdoor art this side of kindergarten.

There's a poker table, an assortment of greasy, overstuffed chairs, a side table covered with the aforementioned magazines and half the parts to a game of Parcheesi. Lamp shades are festooned with old popping bugs and trout flies. Decoys and fishing tackle are scattered everywhere, and there might be an ancient outboard or a stack of deer stands leaning in a corner beside the gun cabinet. The interior is lit no better than a neighborhood bar, which is appropriate because there will also be a bar covered with half-empty bottles — the truly dead soldiers will be under the front porch.

The less said about the kitchen, the better, but the most lasting impression is likely to be how diligent the rats have been in leaving their calling cards in every dish and coffee cup.

The smell of a fishing or hunting camp is a combination of cigar and wood smoke, old canvas, insect repellent, wet wool, wet dogs and fried eggs (the only foolproof hot food), overlaid with the faint, binding aroma of Hoppes No. 9 powder solvent. (Note to women: have you considered wearing Hoppes as a perfume? It would be highly effective.)

Those of us who hunt and fish obsessively — that's redundant, isn't it? — figure that Heaven must be sort of like a big hunting lodge. It's a comfortable spot after a long day, or a long life. We can pile sodden clothes in front of a fire or cast iron stove, snooze on a collapsing sofa under a favorite book and occasionally reach the glass on the floor. That kind of evening, after a day fishing or hunting, sets the world back on its feet.

But it's not always quiet. I recall some years ago staying at a lodge on Currituck Sound with a bunch of elderly and friendly West Virginians. It was a good group, but somewhat given to celebration after a day afield. In the three days we were there, they must have gone through two tons of cracked ice. Numerous times each night, beginning after supper and lasting more or less indefinitely, they would suddenly lurch together at some undetectable (to us, at least) cue and raucously sing this song.

Everytime I go to town,
The boys all kick my dog around.
Makes no difference if he's a hound,
You oughta not kick my dog around.

Upon completion of this warning about the evils of city living, they would resume normal conversation as though nothing at all had happened. In the wee hours of the night, we might be treated to yet another chorus delivered from their various bedrooms where they had apparently awakened and launched into song, again on mysterious cue. It is apparently the kind of thing that develops among long, close friends, and we were not very much put out. Indeed, I came to like them and their song.

It was this same group that bequeathed my companion and me what may have been the finest — and certainly the fullest — meal either of us ever ate. The wife of the lodge owner appeared at the dinner table one evening bearing a huge platter of softshell crabs. I have seen smaller piles of discarded tires. The proprietress left, but as we prepared to feast we noted that the West Virginians seemed riveted in shock.

"What in hell's them?" one said finally.

"Softshell crabs," said my delighted companion.

Simultaneously, they all pushed back their chairs, arose and headed for the door.

"You don't want any?" we asked incredulously.

"We ain't eating no spiders," came the reply.

We ate the spiders. We ate all the spiders while from the next room accompanied by the tinkling of ice in glasses, our insect-fearing companions burst into song.

There may come a time when there are no more hunting and fishing lodges or camps. There may be no wild places left, no wilderness to nurture the creatures that bring sportsmen together. No spiders, no hounds to love or kick around, no sparkling streams or placid lakes, no big woods or lespedeza fields, no choral camaraderie. But I hope I'm wrong, and in any event, I suspect I'll be long gone to that great lodge in the sky where there will be a few old magazines around for the memories.

January, 1988
Volume 52, Number 1

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WILDLIFE IN NORTH CAROLINA

Wildlife in North Carolina is the official educational publication of the North Carolina Wildlife Resources Commission, and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources and the environment we share with them.

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Cover *This handsome male bobwhite quail won't spend much time in the open during late winter, preferring instead the heavy cover in dense bottoms. Photograph by Leonard Lee Rue III.*

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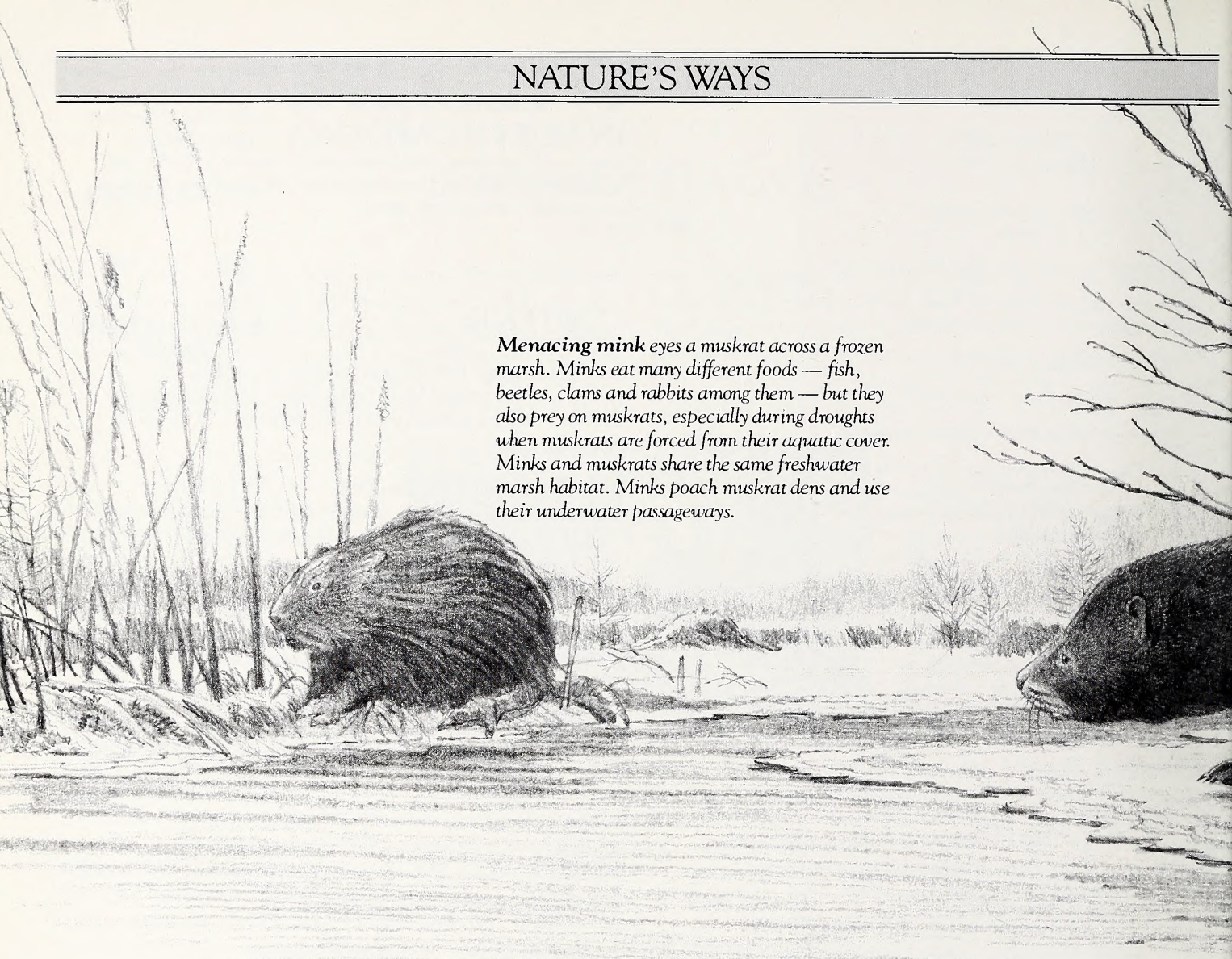


Menacing mink *eyes a muskrat across a frozen marsh. Minks eat many different foods — fish, beetles, clams and rabbits among them — but they also prey on muskrats, especially during droughts when muskrats are forced from their aquatic cover. Minks and muskrats share the same freshwater marsh habitat. Minks poach muskrat dens and use their underwater passageways.*

A Little Bit Of Mayhem

written by Lawrence S. Earley / illustrated by David Williams

Behold the mink, a busy little bundle of fur 20 to 30 inches long and weighing no more than 3½ pounds. Watch it dart along a creek channel, swim across to a muskrat den in the middle of the pond, stick its nose in this crevice, that hole, sniff all around. What mayhem is it up to now?

Trappers have always suspected the worst of mink, especially where muskrats, the foundation of the fur trade, were concerned. "Incarnations of blood lust," "vicious killers" — that's the way generations of trappers have sometimes thought of the diminutive furbearers. What complicates the matter is that this reputation has some basis. Mink have been known to kill many more muskrats and other creatures than they needed for immediate consumption. And when a pregnant female wants a place to bear her young, she will often claim a muskrat den, dispatching each of its muskrat occupants with a bite to the neck.

But studies of mink feeding habits show that muskrats are far from their only prey. They are opportunistic feeders, and more frequently feed on crayfish, poultry, salamanders, crickets, squirrels, snakes and turtles. They will also eat small birds or their eggs, mussels and clams. In North Carolina, mink eat mostly fish.

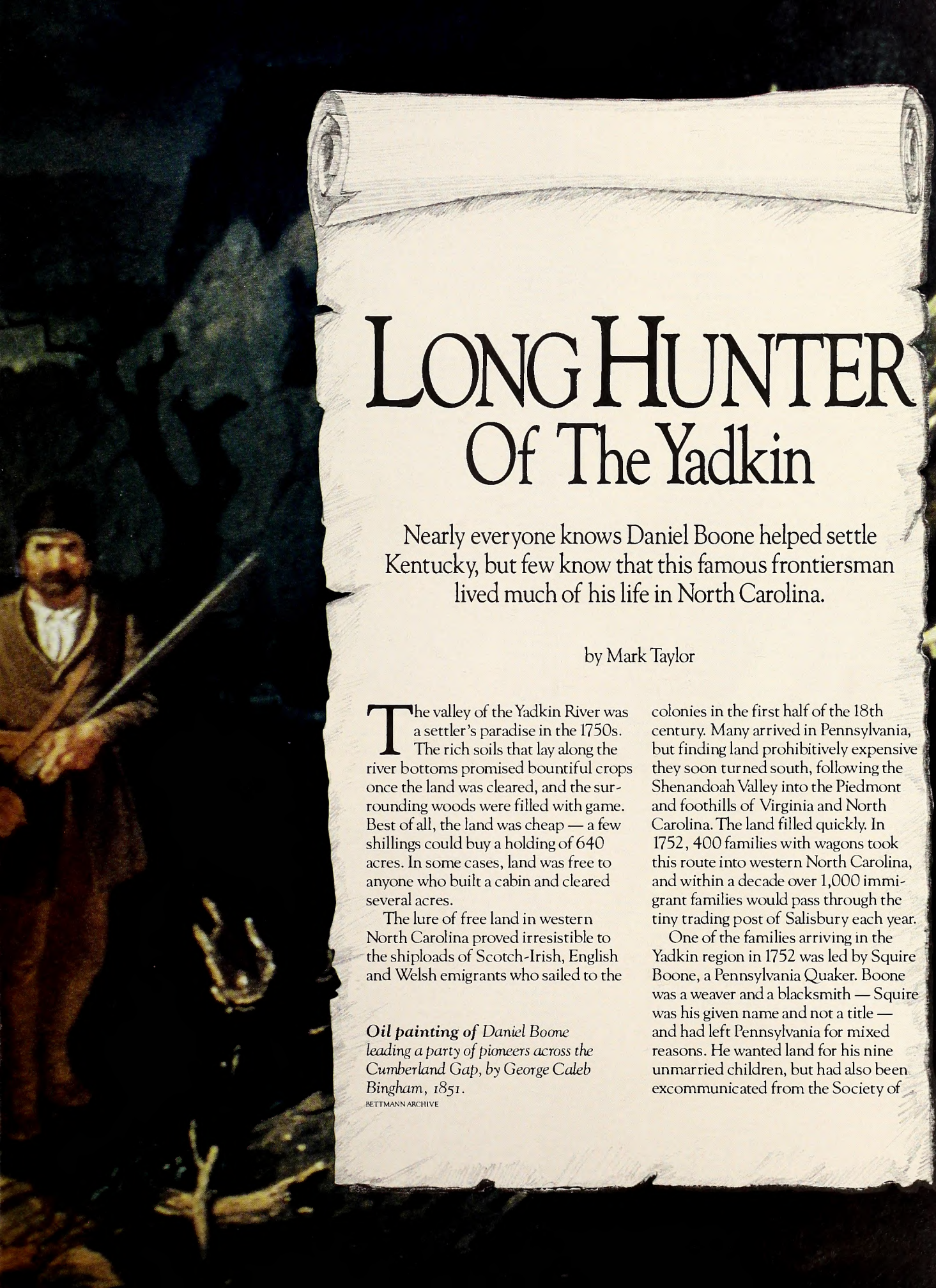
Some of the mink's reputation for viciousness may be a result of its sobering physical appearance. With its beady black eyes, pointed snout, and needle teeth it looks as though it could do some damage. It's a member of the family *Mustelidae*, counting as its cousins skunks, weasels and river otters, among

other fur-clad family members such as ferrets and martens not found in North Carolina. All are characterized by long bodies, short legs, sharp teeth and, especially in the case of the skunk, pungent anal scent glands. The mink's lustrous, silky fur is made into coats or stoles, perennial symbols of status among the wealthy.

Minks mate toward the end of February, drawn together for the only time of the year. Strangely, the female breeds on the same day every year, and on the same day as its mother bred. When ready to give birth, the female seeks a muskrat den or woodchuck burrow. Because of delayed implantation, the young — three to eight hairless creatures — are not born until May. It's not until the young are five weeks old that their eyes open and they walk about on wobbly legs. They are weaned at about eight weeks. By midsummer the young are leaving the mother to forage for themselves, and from then until the next breeding season they will lead a solitary existence, roving and hunting.

Minks are great travelers. A male patrols a circular range of up to 25 square miles, following creek channels and sticking its pointed snout into just about every hole and burrow in sight. Scientist Paul L. Errington says a mink looks as if it is wandering aimlessly, but it actually restricts its wandering to familiar places. It can travel by land or by water, although it is a better land traveler in spite of its small legs. Errington calls it "an animal of the water's edge."

Mink and muskrats inhabit overlapping wetland habitats, mostly streams, ponds and swamps. The muskrat is the superior engineer, building underwater passageways and dens for its progeny, while the mink's skills lean more toward breaking and entering. It's an arrangement that's admittedly better for the mink, but the muskrat has learned to live with it.



LONG HUNTER Of The Yadkin

Nearly everyone knows Daniel Boone helped settle Kentucky, but few know that this famous frontiersman lived much of his life in North Carolina.

by Mark Taylor

The valley of the Yadkin River was a settler's paradise in the 1750s. The rich soils that lay along the river bottoms promised bountiful crops once the land was cleared, and the surrounding woods were filled with game. Best of all, the land was cheap — a few shillings could buy a holding of 640 acres. In some cases, land was free to anyone who built a cabin and cleared several acres.

The lure of free land in western North Carolina proved irresistible to the shiploads of Scotch-Irish, English and Welsh emigrants who sailed to the colonies in the first half of the 18th century. Many arrived in Pennsylvania, but finding land prohibitively expensive they soon turned south, following the Shenandoah Valley into the Piedmont and foothills of Virginia and North Carolina. The land filled quickly. In 1752, 400 families with wagons took this route into western North Carolina, and within a decade over 1,000 immigrant families would pass through the tiny trading post of Salisbury each year.

One of the families arriving in the Yadkin region in 1752 was led by Squire Boone, a Pennsylvania Quaker. Boone was a weaver and a blacksmith — Squire was his given name and not a title — and had left Pennsylvania for mixed reasons. He wanted land for his nine unmarried children, but had also been excommunicated from the Society of

***Oil painting of** Daniel Boone leading a party of pioneers across the Cumberland Gap, by George Caleb Bingham, 1851.*
BETTMANN ARCHIVE

LONG HUNTER
Of The Yadkin

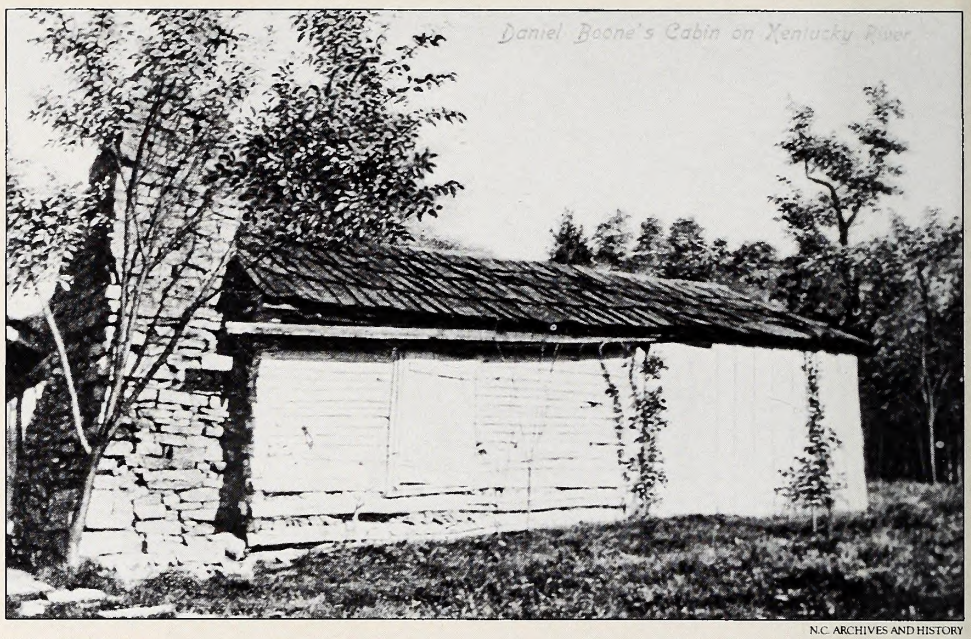
Friends after a daughter, Sarah, and a son, Israel, married out of the faith.

Among Squire Boone's children were two exceptional sons, Daniel and young Squire. Daniel was 18 years old when the family arrived in North Carolina, and would become perhaps our nation's greatest frontiersman. Although he will aways be associated with Kentucky, Daniel Boone lived in North Carolina for 21 years — longer than anywhere else. His exploration of the lands west of the Appalachians, moreover, was financed by a consortium of Hillsborough businessmen who hoped to make a fortune establishing a trading empire west of the mountains. Young Squire Boone has been lost in his famous brother's shadow but was an equally able woodsman, and also played an important role in opening Kentucky.

The sites of the various Boone homesteads in North Carolina, especially the first, are subjects of contention. One report places the elder Boone's first homestead on the east side or left bank of the Yadkin River in Boone Township, Davidson County, four miles from present-day Churchland on N.C. 150. A cabin with the words "D. Boone" cut into the chimney foundation existed until the early 1900s, and local place names include a Boone's Ford, Cave, Spring, and Bottom Tract. In any event, Squire Boone did not stay in his first home long. In 1753 he moved to the west side of the Yadkin, settling near Dutchman's Creek in Davie County.

Here, for the next 13 years, Daniel Boone learned the skills that were instrumental in his exploration and settlement of Kentucky. His father taught him two trades — blacksmithing and weaving — and Daniel also helped farm, survey land, and lay out roads. He never cared for farming, though, and hunting soon became his main occupation.

Deer meat had little value to the settlers, but deer hides were the accepted currency of the Carolina back country. A good hunter could kill 500 or more deer in a season along the Yadkin, and Boone and the other hunters sold their hides in the small settlements of Salisbury and Lexington. The wealthy Moravian merchants of Bethabara, where the city of Winston-Salem would later develop, purchased large numbers of these hides, and shipped them overland to Charleston for export. In 1753, for example, 30,000 deer hides were exported from North Carolina, and one wagon train leaving Bethabara carried 7,000 pounds of hides.



N.C. ARCHIVES AND HISTORY

Daniel Boone's cabin *on the Kentucky River was one of his many homes. Although he lived 21 years in North Carolina, none of his cabins remain.*

In 1755, Boone joined the North Carolina militia as a wagoner under Captain Hugh Waddell. A large army under British General Edward Braddock was cutting a road to the west, determined to drive the French out of the Ohio River Valley. On the trip was an older wagoner, John Finley, who became a good friend of Boone's. During the previous year, Finley had crossed the mountains into Kentucky on a long hunt and told Boone of the fabulous hunting there. Braddock's army soon encountered a band of French and Indians, however, who ambushed them in a small ravine. Most of the soldiers were killed or taken prisoner in Braddock's defeat, but Boone, Finley and the other wagoners escaped by cutting the traces to their wagons and fleeing with their teams. Boone was not to see Finley again for 14 years.

Surprised by Shawnee Indians *while hanging tobacco, Boone escapes by blinding them with tobacco dust. Although he lost two sons to Indian attacks, Boone bore the Indians no grudge, considering violent death a hazard of frontier life.*

NORTH CAROLINA COLLECTION, UNC LIBRARY AT CHAPEL HILL

Upon his return to the Yadkin, Boone married a neighbor, 17-year-old Rebecca Bryan, in 1756. For the next 17 years, Daniel and Rebecca Boone lived in several homesteads along the Yadkin. Their first home was a log cabin in the elder Squire Boone's yard, but they soon built a home of their own on Sugar Tree Creek, a tributary of Dutchman's Creek in Davie County. The couple left the Yadkin, as most other settlers did, when war with the Cherokees erupted in 1759. Boone took his young family to Culpepper County, Virginia, staying until 1762. During that time, he worked as a wagoner and also may have served in a Virginia regiment in a campaign against the Indians.

In 1764, the couple moved to Holman's Ford on the upper Yadkin, 7½ miles above

Even in his *70s and 80s Boone loved to hunt, often accompanied by his grandson or just his dog. Some historians believe that in his later years, he may have hunted as far west as the Yellowstone area of Wyoming.*

N.C. ARCHIVES AND HISTORY

LONG HUNTER
Of The Yadkin

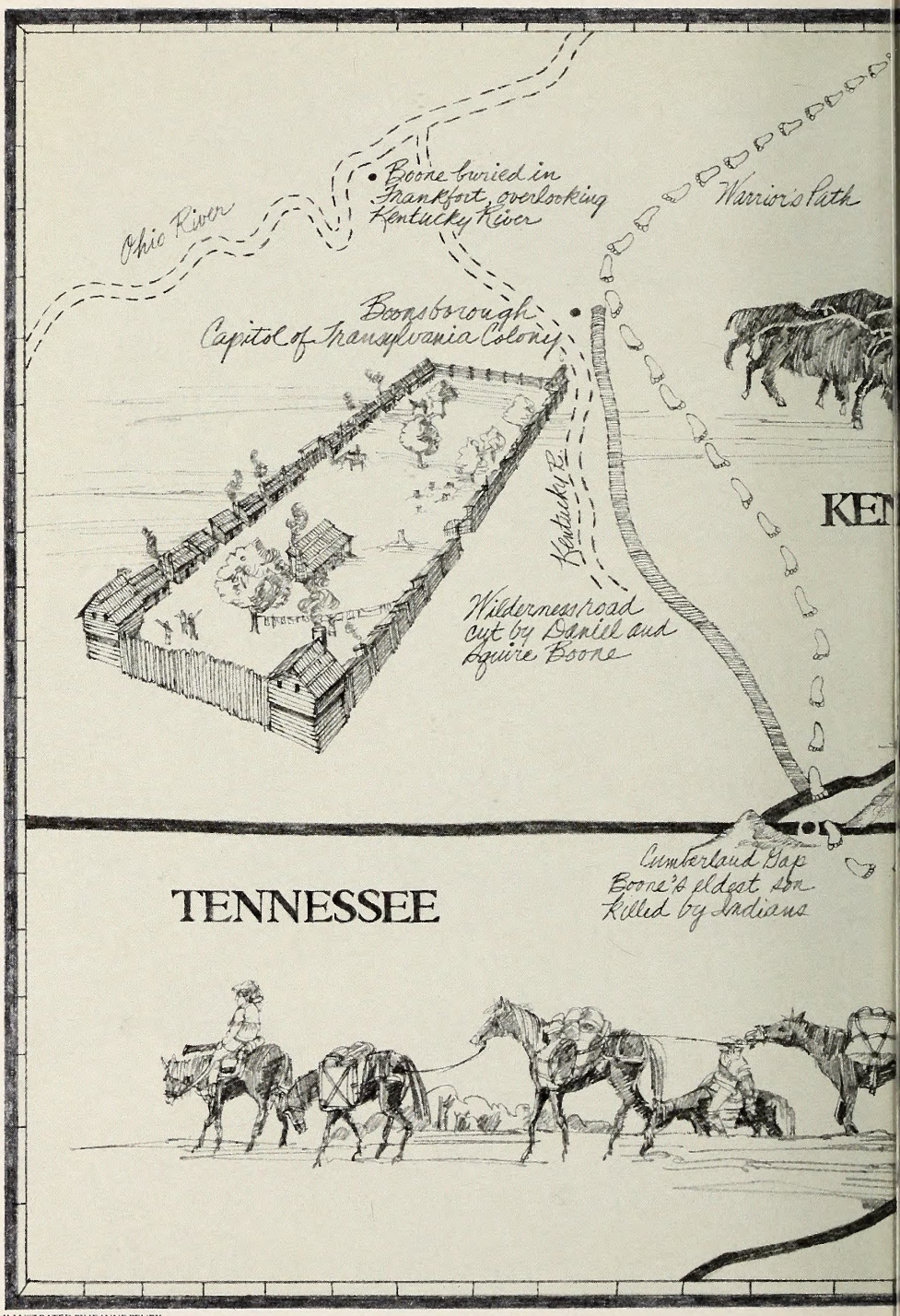
present-day Wilkesboro. They soon moved again, going five miles farther up the river and a half-mile up Beaver Creek in Wilkes County. Still not satisfied, a short time later Daniel and Rebecca moved to their final North Carolina home across the Yadkin River opposite the mouth of Beaver Creek.

Upon returning to North Carolina, Boone still farmed but spent most of the year hunting deer. He became one of a handful of "long hunters," or frontiersmen, mostly from the back country of North Carolina, Virginia, and Pennsylvania, who crossed the mountains into Tennessee or Kentucky on extended hunting trips, often lasting a year or more. Boone made his first foray into Kentucky in 1767, accompanied by a neighbor and probably his brother Squire. The men ventured 100 miles beyond the West Fork of the Big Sandy River before returning home.

While Boone hunted, however, all was not well on the farm. Greedy crown officials were levying excessive taxes, declaring existing deeds invalid, and demanding that new deeds be filed for exorbitant fees or property would be confiscated. These injustices ultimately led to the Regulator movement which culminated in the Battle of Alamance in 1771. However, Daniel Boone's neglect of his farm led to frequent appearances before the Salisbury court for non-payment of debts.

Richard Henderson, an old family friend, was his frequent attorney, though at times he also served as judge. Despite his financial troubles, Boone was regarded as a reliable and honest man, and Henderson employed him on several occasions to lay out roads and survey land along the Yadkin. Henderson listened intently to the young scout's tales of Kentucky, for he was formulating a plan to establish a new colony in the wilderness called Transylvania.

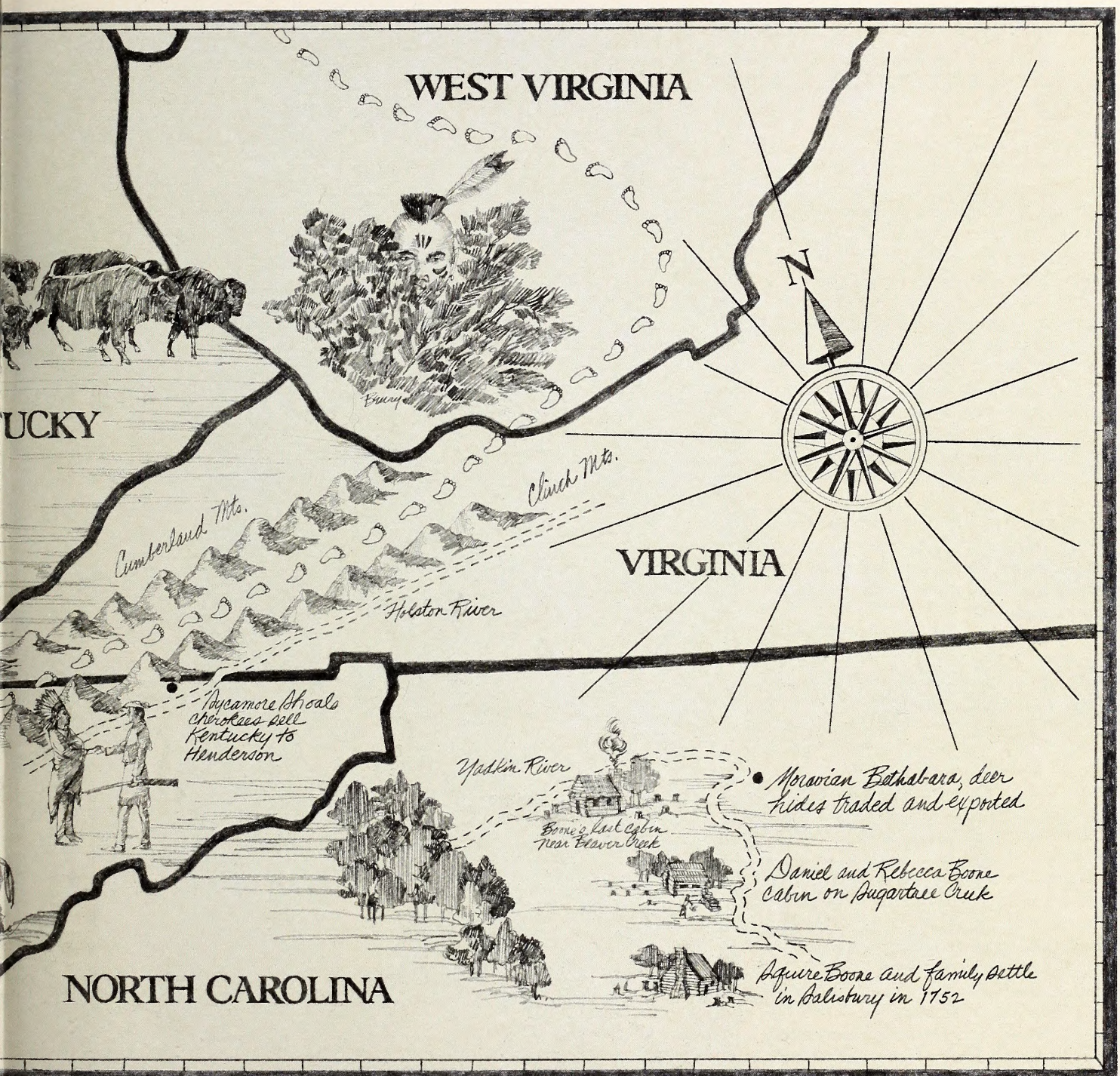
In 1769, Boone answered a knock on the door to greet his old Army comrade, John Finley. Finley was working as an itinerant peddler and had learned of Daniel's presence on the upper Yadkin while selling his wares in Salisbury. Finley had traveled down the Ohio River to trade with the Indians two years before and wished to return with a handful of experienced hunters. The men talked to Henderson, who financed the expedition and hired Boone to explore the vast hinterland.



ILLUSTRATED BY JEANNE BEURY

Equipping a long hunt was a costly venture. Each man needed two horses and at least two rifles; blacksmithing tools which included a hand-vise, bellows, files, and spare locks; traps for catching beaver and otter during the winter; and camp supplies such as iron pots, blankets, flour and salt. Boone formed a party of six — which included Finley and his brother-in-law John Stuart — in the spring of 1769. Squire Boone agreed to meet the group in Kentucky with another year's supplies in the following spring, then return to the Yadkin to sell the party's deer skins and furs.

Boone was gone for two years. Once, in the winter of 1769, his camp was raided by a party of Shawnee Indians. The men were stripped of all their possessions and told to go home. Boone and his brother-in-law tried to recapture their horses, only to be caught again. They were told they would be marched north of the Ohio River and released, but they escaped into a canebrake. Shortly thereafter, John Stuart disappeared while trapping. When Squire Boone met them with supplies in 1770, Finley and four others chose to take their few deer skins and pelts back to the settlements. Daniel decided to stay for another year, and arranged another



meeting with Squire. He eluded the Indians by camping without fires deep in the canebrakes as he ranged throughout Kentucky. As promised, Squire met him again in the spring of 1771. On their way back to the Yadkin, however, they were robbed again, this time by the Cherokee.

Daniel Boone had spent two years in Kentucky and had only the clothes on his back and a knowledge of the countryside to show for it. His situation wasn't unique, however. The Treaty of Fort Stanwick, signed in 1768 by the Iroquois and Cherokee tribes and crown officials, stated that Kentucky and Tennessee belonged to the Cherokee. The Indians quite rightly regarded the long hunters as poachers and routinely plundered their camps. The long hunters were usually left with their clothes, an old musket and enough powder and shot to kill game on the way back to the settlements, and explicit instructions not to return. After losing a year's worth of deer hides to the Cherokee, one party of long hunters carved the message "2,300 hides gone, ruination by God" on a yellow poplar tree.

When Boone returned to Salisbury, he learned that Richard Henderson was presiding over superior court in Hillsborough. After hearing Boone's reports, Henderson was enthusiastic about settling Kentucky but was unable to take any action until after his term as judge expired in 1773. Boone grew impatient, and took his family and five others from the Yadkin to establish a settlement in Kentucky. They were attacked by a large party of Shawnee in the Powell River Valley just east of Cumberland Gap. Several men were killed, and Boone's eldest son, James, was captured by the Indians and tortured to death. After recovering and burying their dead, the entire party returned to the

LONG HUNTER
Of The Yadkin

Clinch River valley in Virginia.

Henderson, however, still had plans. On August 27, 1774, he and a handful of Hillsborough businessmen chartered the Louisa Company, named after the Louisa River, now the Kentucky River. A year later, the company's name was changed to the Transylvania Company, and its avowed purpose was to "rent or purchase" a tract of western land for settlement.

Several obstacles lay in Henderson's path. King George III had issued a proclamation in 1763 prohibiting further white settlement upon Indian lands west of the mountains, and both Virginia and North Carolina had passed laws prohibiting individuals from purchasing Indian lands. The ambitious judge, however, had found a loophole in the law designed to allow the powerful East India Company to purchase land from "Indian princes or governments" independent of the crown.

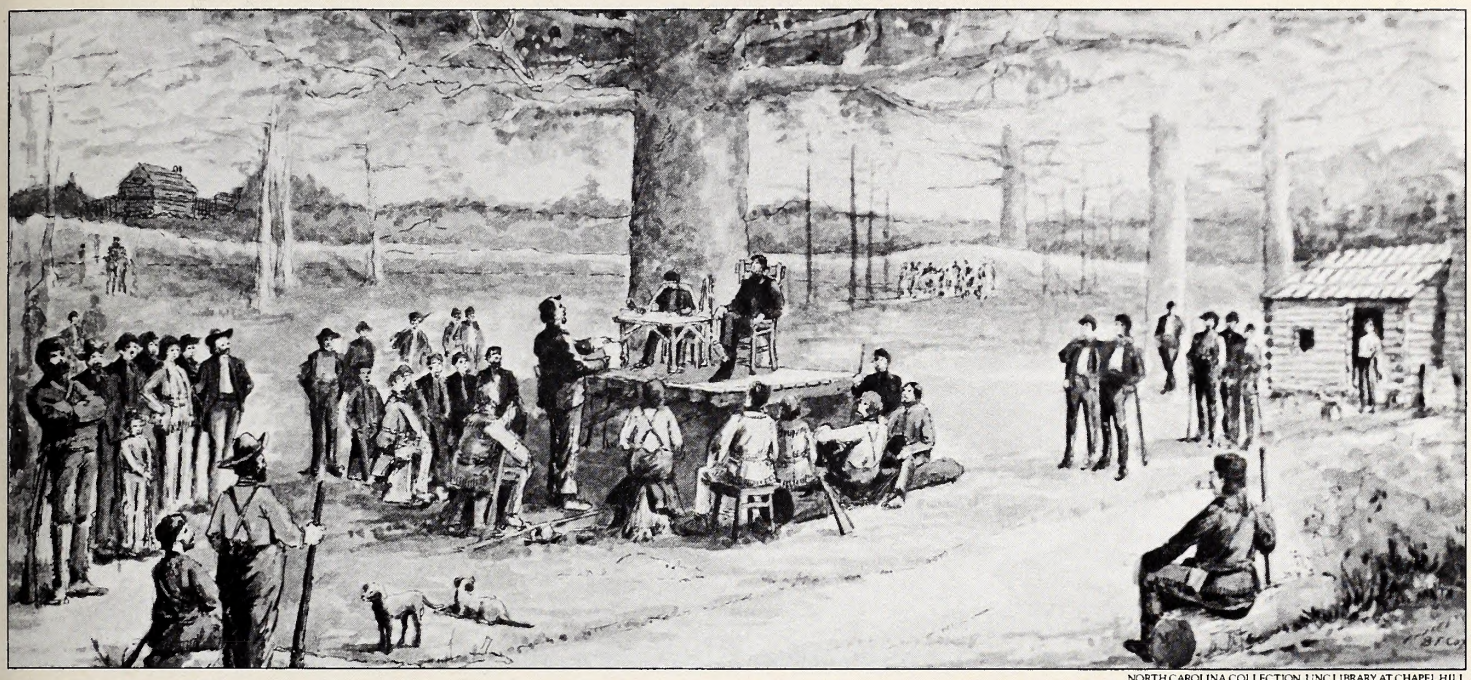
Henderson hoped to make the East India Company clause apply to the Transylvania Company, and the first step was to purchase Kentucky from the Cherokee. He, Boone, and another agent — James Robertson — visited all of the Cherokee villages. The men succeeded, and in a treaty signed at Sycamore Shoals in Kentucky on March 17th, 1775, the Cherokees sold the Transylvania Company 20 million acres of land for 10,000 pounds in goods.

Kentucky was not to be won easily, however, and during the negotiations one Cherokee confided to Boone, "Brother, we have given you a fine land, but I believe that you will have much trouble in settling it." The first in a long series of Indian attacks occurred a few weeks later while Boone, his brother Squire, and 30 axemen were cutting their wilderness road to the settlement that Henderson would later name Boonesborough in his friend's honor. Early parties of settlers were also attacked, and began turning back. In desperation Boone wrote to Henderson, urging him to come out to Kentucky and help get the settlements established. Henderson immediately came to his aid, bringing with him a large party of settlers, and persuading many of the frightened and discouraged families he met on the way to return to Kentucky.

However, a dour Henderson noted that the settlers' carelessness in posting sentries was the cause of many attacks. "They would all agree in the morning," he wrote, "that it would be highly prudent and necessary to keep sentinels around our camp at night; but a hearty meal or supper (when we could get it) and good fires, never failed to put off the danger for at least 24 hours; at which time it was universally agreed, on all hands, that a watch at night would be indispensably necessary."

N.C. ARCHIVES AND HISTORY

***Judge Richard Henderson** hoped to establish his own colony west of the mountains, and hired Boone to explore Kentucky. Henderson's Transylvania Company, supported by a handful of Hillsborough businessmen, soon ran afoul of colonial and British officials.*



NORTH CAROLINA COLLECTION, UNC LIBRARY AT CHAPEL HILL

The Transylvania legislature *met for its first, and only, meeting in 1775, issuing its Declaration of Independence. Only the outbreak of the Revolutionary War prevented the colony's immediate absorption by Virginia.*

NORTH CAROLINA COLLECTION, UNC LIBRARY AT CHAPEL HILL

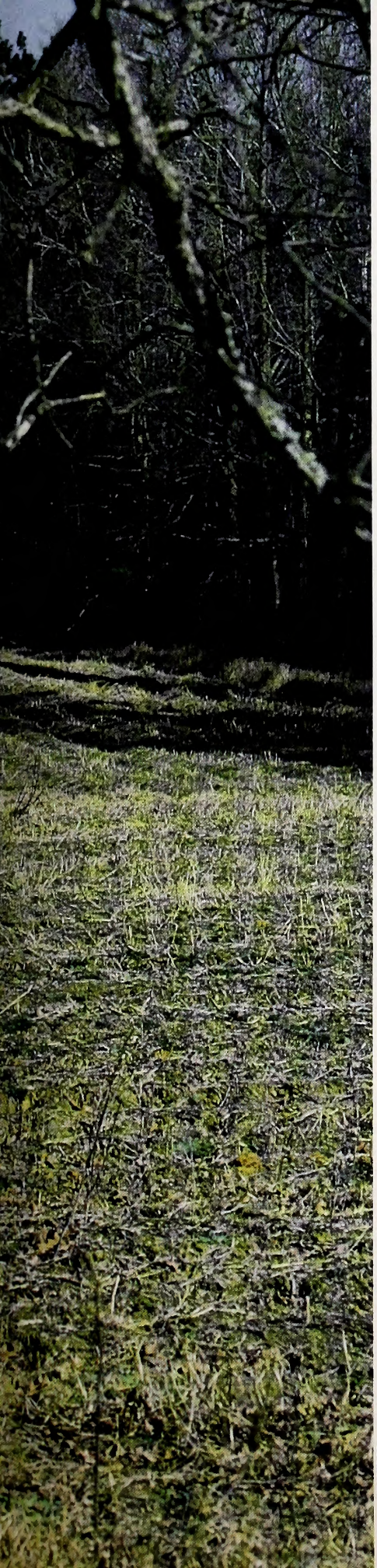
Daniel Boone's parents *were among the earliest settlers of the Yadkin River Valley, and are buried in the Old Joppa Cemetery in Mocksville. Squire taught his son Daniel two trades, blacksmithing and weaving.*

Henderson and Boone succeeded in establishing a settlement at Boonesborough, and on May 23, 1775, the settlers met to issue the Transylvania Declaration of Independence. The declaration asserted that the colony "had the right to make necessary laws for the regulation of our conduct without giving offense to Great Britain or any of the American colonies."

The proprietorship form of government established for the fledgling colony was also designed to make Henderson and his partners rich. Settlers who purchased land would still be required to pay perpetual annual rents to the Transylvania Company, and its owners could veto any provision passed by the colony's legislature. When the Revolutionary War broke out, Henderson sent one of his partners — James Hogg of Hillsborough — to petition the Continental Congress to recognize Transylvania as an independent 14th colony. John Adams, Samuel Adams, Thomas Jefferson and Patrick Henry objected, wishing to see the settlements become part of Virginia. This ultimately occurred, but in recognition of his services in opening the back country Henderson later received grants of land totaling nearly 400,000 acres in Kentucky and Tennessee from the new states of Virginia and North Carolina. Boone, who had registered claims for nearly 100,000 acres of land with the Transylvania Company, received nothing.

Under Boone's leadership, the scattered settlements in Kentucky survived the Indian raids directed by the British during the Revolutionary War. As a safer Kentucky filled with settlers and achieved statehood after the Revolution, Boone became its most venerated citizen. Kentucky was growing crowded, however, and in 1799 he and Rebecca moved to the Spanish territory of Missouri, settling about 40 miles west of St. Louis.

Even in his 70s and 80s, Boone never lost his love of adventure. He volunteered for service in the War of 1812, but was turned down because of his age — 78. Three years later, he accompanied his son on a hunt that may have extended as far west as the Yellowstone area in what would become northeastern Wyoming. He died peacefully in his bed in 1820, a few weeks shy of his 86th birthday. At the time the doctors said the cause of death was an "attack of acute indigestion brought on by eating too many sweet potatoes for supper," an unusual end for the long hunter of the Yadkin. ⊠



KEN TAYLOR

Second Season

The bobwhite quail becomes an especially elusive quarry for hunters during the waning months of winter, but the situation isn't hopeless.

by Jim Dean

Sometime between New Year's Day and the end of the season, there comes a spell of weather quail hunters have learned to dread. It usually arrives in late February on a wind that has lost its flinty edge. Suddenly, the land no longer has that monochromatic look — gray fields, gray woods, gray skies. There is more than a promise of warmth in the air, and the world is swelling like a seed right before your eyes.

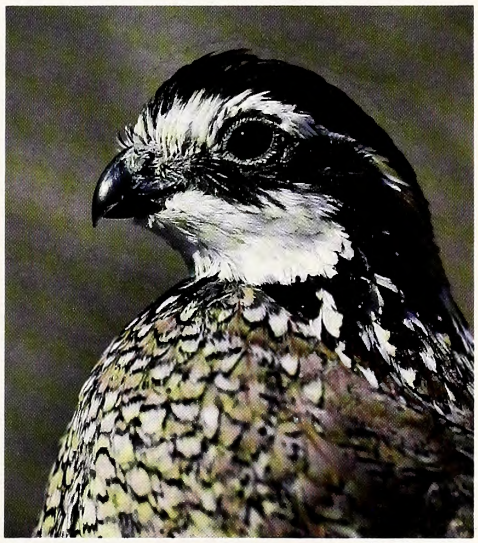
"I know it's nearly over, then," laments Mike Gaddis. "On days like that, the dogs will run until their tongues loll, wallowing in mud puddles whenever they can. We'll hunt hard, of course, and by changing our tactics we may still find birds on some outings. But we expect less, and our expectations are seldom exceeded. I hate it."

Every post-holiday quail hunter knows that feeling well. In fact, for most of us, finding birds often becomes an increasingly tough assignment long before the arrival of those late winter warm fronts. It seems almost as though there are actually two quail seasons, the same as their are two halves to a football game. The first half of the quail season — from opening day in November through December — demands one game plan. However, from around New Year's through the end of February when the season closes, it's likely to be a whole new ballgame.

Young birds are smarter and faster, and coveys are smaller, more wary. The birds tend to change their habits, flush wild, sit in trees, hang around in different places, and may even feed on different foods. Quite honestly, I have never killed many quail in late season, and many far better hunters also experience diminished success.

It's not a hopeless situation, of course, and some of us will even admit to a certain preference for the months after Christmas. For one thing, with the close of deer season, we're likely to share the great outdoors with only a diehard core of bobwhite, squirrel and rabbit hunters. Also, the dogs are at their peak, and so are their masters. It's a time when pros and survivors get down to serious business.

One point ought to be cleared up right



LEONARD LEE RUE III

***Few gamebirds attract** a more loyal following than the quail, nor are many gamebirds as handsome as the male.*

***Somewhere in the** thick edge of the field, a covey of bobwhites is about to attempt a getaway. A relatively open shot at the edge of a field is not all that common in the latter half of the season.*

Second Season

away. No truthful bird hunter I know has ever completely mastered the late season. It's too complex, too unpredictable, and not the least of it are the changes that have occurred over the years in our small-game populations.

Over 816,000 quail were killed in North Carolina's 1983-84 season, and some biologists estimate that may be about 20 percent of the population. Even as late as the 1964-65 season, however, hunters harvested 2.8 million quail.

The reasons for the apparent decline in numbers of some small-game species are complex and interrelated, involving such varied influences as pesticides, predators, genetics and many other factors. But most important, the habitat for small game is both changing and rapidly dwindling.

Still, it may not be a hopeless situation — after all, 20 years ago, who would have predicted the restoration of turkey and deer populations? With new research projects and cooperative programs gaining strength and support in North Carolina and throughout the Southeast today, many biologists believe we may not be witnessing the end of small-game hunting, but the beginning of a new era. Even if they're right, and solutions can be found and implemented, restoration of our small-game populations will still not occur overnight. But at least there is hope.

Although current bobwhite populations may not compare in most parts of the state with those found here in the 1930s, there are still a lot of birds around if you know how to hunt them. And it may be moderately encouraging to realize that late-season quail hunting has always been a test — even during those memoried days of yesteryear.

Jimmy Davis, a fisheries biologist from Elizabethtown, and an avid bird hunter, likes the challenge, and he doesn't mind changing his tactics.

"I try to find coveys that haven't been hunted very much, and that usually means spending a lot of time in the woods or in thick bottoms," says Jimmy. "They may be there because of hunting pressure, but it could also be pressure from other predators.

"During the 30 years I've been hunting quail, I've also noticed that I find a lot of birds in hedgerows during the latter half of the season," says Jimmy. "With the new, clean-farming methods, many fields are left fairly barren in winter and they don't provide much cover. If a farmer leaves thick hedgerows along these fields, the birds will use them. If you find hedgerows that have been thinned, however, the birds will leave."

***Jimmy Davis and** his setter get ready to tackle a thick creek bottom. Years of experience have taught them that this kind of cover will be the most likely place to find bobwhites in late winter.*

Jimmy is also fairly certain that quail change their diets during late season, feeding more frequently on natural foods deep in the woods.

"When they come to the fields, they don't dally," he adds. "I sometimes find them in fields or along the edges in mid- to late afternoon, but seldom at other times."

Most quail hunters share that view, and Terry Sharpe, small-game project leader for the N.C. Wildlife Resources Commission, is pretty sure he knows why.

"It seems that more and more coveys no longer walk into fields to feed leisurely," he says. "Instead, they fly as a group to and from fields, leaving little if any scent for dogs to find along the edges. Furthermore, they treat a field sort of like a fast food joint. They get in and grab a meal and get out, and they don't dawdle as they might have years ago. This is especially true of soybean fields because it doesn't take the birds long to fill their crops with soybeans."

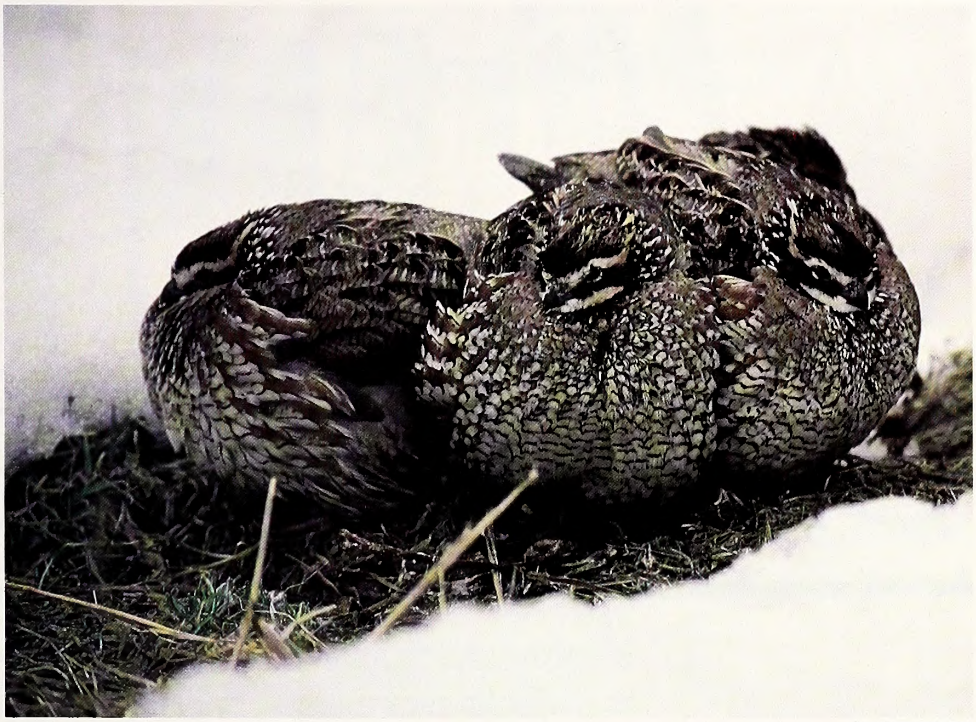
From his studies and experience as a hunter, Terry is convinced that quail often change their eating habits and choices of food in the season. If so, that is one key to finding them.

"If you kill a bird, open its crop and see what it's been eating," he says, "then try to hunt areas that have good supplies of that

KEN TAYLOR

kind of food. Late in the season in my part of the state — the Sandhills — I more often find birds in swampy thickets where there is a lot of red bay. Not only do the birds seem to prefer red bay berries this time of year, the thickets where they are found give them good cover."

Terry also has another tip you don't hear every day, and "hearing" is part of it. "A few of the best quail hunters I know spot the general location of coveys by going out in the mornings and simply listening for calls," he says. "Sometimes, you can elicit responses from wild birds by faking a whistle. It's against the law to use recordings in North Carolina, but some people get pretty good at faking the whistle of a quail. Of course, this works better in early season, but it can also work during the second half, and it may be worth a try if you're having trouble locating coveys."



LEONARD LEE RUE III

Bobwhites roost *much the way western settlers circled their wagons, backing into a tight circle to concentrate warmth and keep a lookout for danger in all directions.*

LEONARD LEE RUE III

Quail seldom show *themselves as boldly as this male on a fence post, especially in late winter. Feeding forays to fields are brief, and they spend far more time in thick cover.*

Another serious bird hunter, Mike Gaddis, shares the general advice to hunt thick cover and woods, but he also feels strongly that one of the most important keys to success is timing.

"I can almost predict the kinds of days when I will have poor or mediocre success," Mike says. "Windy days are often less successful, perhaps because the birds stay holed up, and the dogs have more trouble smelling them. Also, I don't normally do terribly well on rainy days. Likewise, a cold, bright sunny day amid a string of similar days may seem promising, but it's never been particularly good for me."

The kind of day Mike likes is the last sunny day just before the passage of a cold front which brings in rain or snow.

"You don't get too many of those days, or at least you certainly get fewer of them, but if you want to maximize your chances of a good hunt, you've got to be ready to go when the weatherman gives you the word," says Mike. "That's particularly true during the second half of the season. The birds know what's coming, and just like grocery shoppers before a snow they will be out stocking up on provisions. If you're there, too, you're more likely to find them."

All this may be falling on deaf ears if you've already given up, put away your guns, and are spending most of your time ordering plastic worms and spinnerbaits for spring. But somewhere beyond your frosted picture window, there are some diehard "bud hunters" who're still at it. And they don't miss us at all. ⊠

Writers Of The Purple Prose

Hunting and fishing may not rank as major literary themes, but North Carolina has produced a large and highly readable body of sporting books and articles by Horace Kephart, Robert Ruark and others.

by Jim Casada

"The way them curs crawl up to the blaze," said Wid Medford, "is a shore sign thet hits goin' ter be cold nuff ter snow afore mornin'. . . . Watever I talk of as facts, you kin count on as true as Scriptur.' "

— *In the Heart of the Alleghanies* (1883), by Wilbur G. Zeigler and Ben S. Grosscup

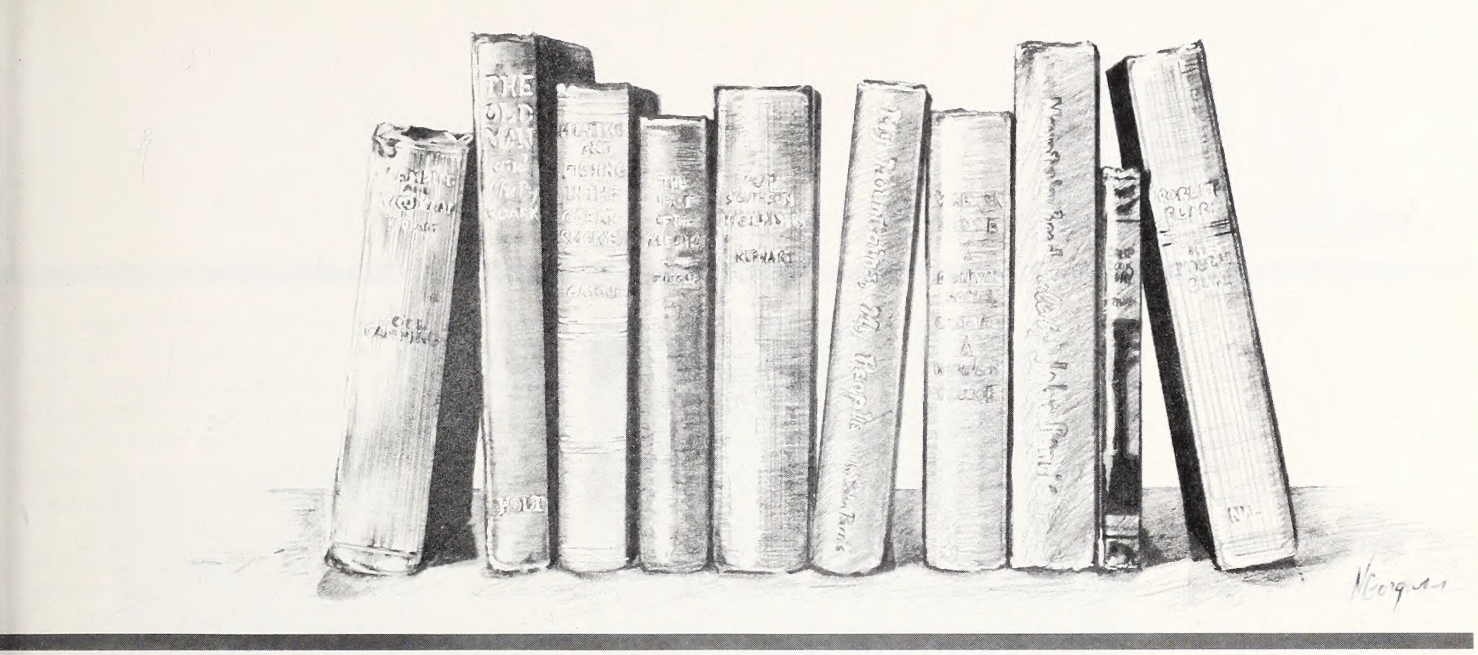
As North Carolinians we take justifiable pride in our rich and varied heritage. We have a storied history, and a devotion to the past is deeply ingrained within us. One particularly noteworthy aspect of that past lies in the field of literary endeavor as is readily evidenced by browsing most any anthology of Southern writing or the pages of the massive 16-volume *Library of Southern Literature*. In this regard, names instantly spring to mind — Thomas Wolfe, Asheville's verbose mountain whippoorwill, or Greensboro's O. Henry (William Sidney Porter), the master of the ironic short story.

There is another dimension, though, where the state's riches in the form of the printed word have received perhaps less than their due. This is in the literature of the outdoors, and the available wealth is such that any Tar Heel lover of sport who has not read deeply in the field has a treat awaiting him. After all, from early colonial days hunting, fishing, and other outdoor pursuits have been of singular importance to North Carolinians. Indeed, right down to the present day, activities afield and astream bring both considerable pleasure and welcome fare for the family table. The sporting life gives us needed recreation, a special feeling for the genteel ways which characterize a world we have lost, communion with nature, and rare opportunities for true camaraderie.

It is pure pleasure to enjoy the outdoors in person, but it is also well to remember that, as noted angling writer Arnold Gingrich once commented, "some of the best fishing is done in print." The same is true of hunting, and the vicarious pleasures of a good sporting tale are undeniable. Through the medium of the printed word we are carried to covey rises and memorable catches of days gone by, or perhaps we are simply privileged to relive a few moments of the halcyon days of our youth. Whatever may be the case, it behooves North Carolinians to be aware of their sporting heritage in literature, and what follows is a brief excursion down those darkening lanes which lead us to the glories of yesteryear.

Many Tar Heel authors have written, and eloquently so, of the undeniable wonders of life in the outdoors. For example, as early as 1859, "Skitt" (the pseudonym of H.E. Teliaferro) provided a memorable, often hilarious, account of hunters he knew in a work which is now a recognized classic, *Fisher's River: North Carolina Scenes and Characters*. A generation later, in 1883, the now rare work by Wilbur Zeigler and Ben Grosscup, *The Heart of the Alleghanies, or Western North Carolina*, gave a detailed account of sport in the Old North State. Similarly, W.E. Stone's biography of his father, *Walton Stone: A Bunyan, Boone, Crockett, a Robinson Crusoe*, published in 1931, is a wonderful reminiscence of what the sporting life was like in the eastern part of the state early in this century. There are also dozens of books, such as Jim Gasque's *Hunting and Fishing in the Great Smoky Mountains*, dealing with the outdoors which are of the "how to" and "where to" genre; many of the tales of mountain life which form John Parris' books (*Roaming the Mountains, My Mountains, My People, Mountain Bred, The Storied Mountains*, and others) relate to hunting and fishing; and a currently active Tar Heel outdoor writer, W. Horace Carter, has written roughly a dozen sporting books.

There are two North Carolina writers, however, who stand in a class by themselves when it comes to



outdoor literature. Both were authors of books which I ranked, in an article published several years ago under the title "Can You Name the Top Ten?" as among the 10 best-selling sporting works of all time. The books were *Camping and Woodcraft* and *The Old Man and the Boy*, by Horace Kephart and Robert Ruark respectively. Kephart and Ruark both earned widespread fame for their literary endeavors, and in addition to being the author of a bestseller, each was a talented, prolific writer whose efforts seem destined to weather the ravages of time.

Kephart was a Tar Heel by adoption rather than birth. His was an extraordinarily checkered career, and those who desire additional biographical details may wish to read a profile by George Ellison in the January 1980 issue of this magazine or my introduction to a forthcoming reprint of his *Camping and Woodcraft* (scheduled to be published in 1988 by the University of Tennessee Press). For present purposes, suffice to say that in 1904, having left a promising career as head of The Mercantile Library in St. Louis as well as abandoning his family, "Kep," as he came to be known by the mountain folks, settled down to begin a new life in the heart of the Great Smokies near Bryson City.

In the ensuing 27 years, until his untimely death in 1931, Kephart would realize his stated goal: "When I went south into the mountains I was seeking a Back of Beyond." Much of the time he lived in solitude, including a span of three years on a tributary of Hazel Creek, and every year, for weeks on end, a tent was his home. Kephart thereby experienced, first hand, the art of living close to nature. In time, he would become the nation's leading authority on the subject. Indeed, his livelihood came from freelance writing on the outdoors, and his productivity in the field is little short of astounding, especially when viewed in the context of his never-ending struggle with alcohol. "Kep" had an inordinate fondness for strong drink (perhaps that explains in part his fascination with mountain moonshining), and in a moment of introspection he once admitted his weakness. He inscribed a revealing bit of doggerel on a boarding house wall in Townsend, Tennessee:

Corks are in bottles and easy to pull
And that's why little Horace is always full.

The occasional binge notwithstanding, Kephart produced fine sporting literature almost from the moment he arrived in the Smokies. His articles appeared in all the major outdoor periodicals of the day, including *Outing, Forest & Stream, All Outdoors, Recreation, Sports Afield*, and *Field & Stream*. A series of articles in the latter magazine led to his first full-length work, *Book of Camping and Woodcraft*. Between its initial appearance, in 1906, and the present, the work has gone through a remarkable printing history totaling more than 60 editions, and for many decades it was Macmillan Publishing Company's outdoor standard bearer. Yet when one encounters a survivor of the hundreds of thousands of copies which must have been printed, it is dog-eared, with well-thumbed pages, turned-down corners, and an unmistakable aura of having been well and truly "used." An author could ask no finer compliment.

Along with *Camping and Woodcraft*, which was the title of the book in most of its editions, Kephart wrote a number of other works. *Camp Cookery* appeared in 1910, *Sporting Firearms* in 1912, and *The Camper's Manual* in 1923. He also was General Editor of "The Outing Library," and his expertise on guns and ammunition was responsible for his preparing the portion of several collaborative efforts dealing with those subjects. Kep's *magnum opus*, however, and the work for which he is most widely known, was *Our Southern Highlanders*. First published in 1913 and subsequently revised, this work remains a classic treatment of life in the Appalachians. In it Kephart touches on all aspects of mountain life, but he is particularly good in his coverage of bear hunting and other popular outdoor activities.

Hunting, being in easy reach of all, was the main resort for pleasure [after the war]. Even after the slaves had been freed and the people left off going to the mustering grounds . . . and games of contest mostly discontinued, yet this love for hunting lived on.

— *Walton Stone: A Bunyan, Boone, Crockett, a Robinson Crusoe* (1937), by Walton E. Stone.

Writers Of The Purple Prose

The success of outdoor cookery depends largely upon how the fire is built and how it is managed. A camper is known by his fire. It is quite impossible to prepare a good meal over a higgledy-piggledy heap of smoking chunks . . . or a great bed of coals that will warp iron and melt everything else."

— *Camp Cookery* (1921), by Horace Kephart

HUNTER LIBRARY, WESTERN CAROLINA UNIVERSITY

In 1904, Horace Kephart *settled near Bryson City in the heart of the Great Smoky Mountains. During the next 27 years he explored the mountains and wrote many articles and books including his best work,* Our Southern Highlanders.

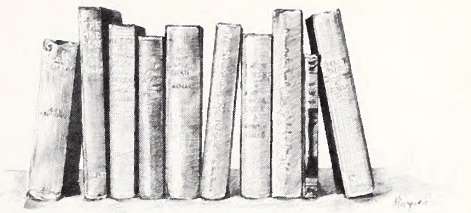
Kephart's literary output declined appreciably in the late 1920s, but for good reason. He became a staunch advocate of the creation of a national park in the Smokies, and to that end he labored tirelessly. While he has received considerably less credit in this regard than he deserves, Kephart should be recognized as one of the key figures in the park's creation. "I owe my life to these mountains," he wrote, "and I want them preserved that others may profit by them as I have." Sadly, he did not live to see his dream become reality. He died in an automobile accident on April 2, 1931, while he and a visiting journalist friend, Fiswoode Tarleton, were returning from a visit to the local bootlegger.

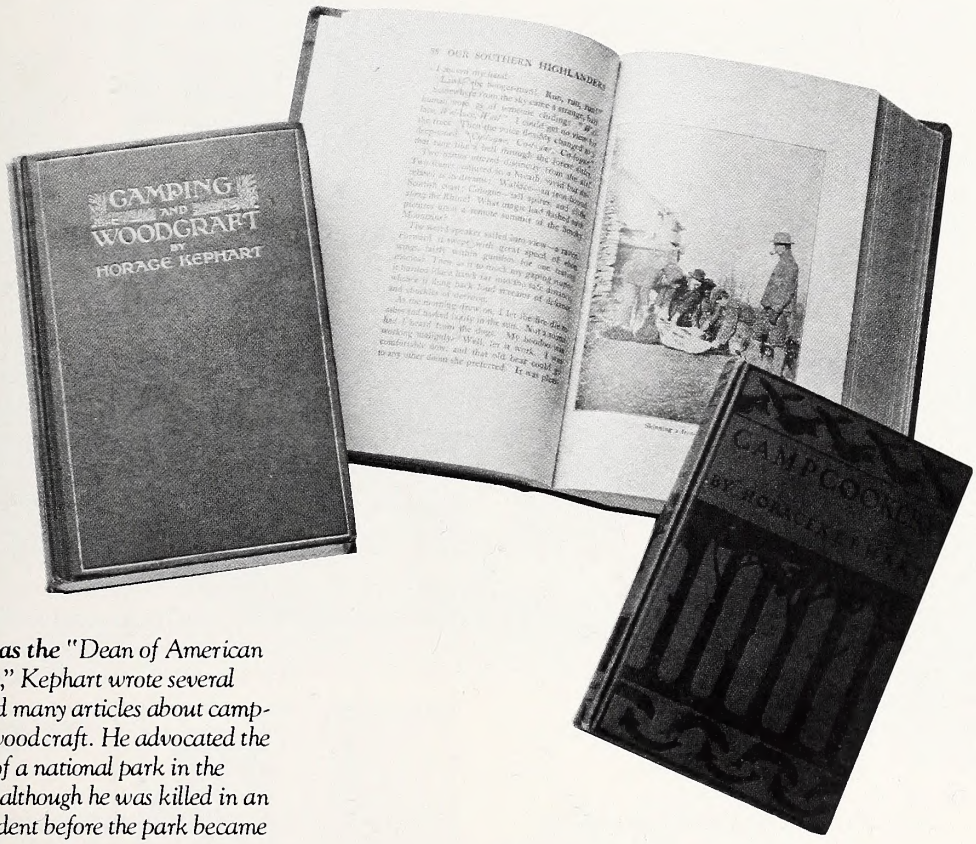
Fittingly enough, he was buried in a gravesite overlooking his adopted home, Bryson City. The plot, situated on a high hill, looks out on the Smokies as they ascend in steep steps up the valley of Deep Creek toward their crowning peak, Clingman's Dome. There is an appropriate poignancy in this, for it was at the Bryson Place, several miles up Deep Creek, that "Kep" made his last permanent campsite. Today, the spot is marked by a plaque resting amidst a grove of hemlocks which recognizes Kephart as the "Dean of American Campers." A few miles away is Mount Kephart, one of the highest peaks in the Smokies, named in his honor only a few weeks before Kep's demise. One can still camp at the Bryson Place, and with the creek's melodious refrain in the background, the truth of his oft-stated adage, "in the school of the woods there is no graduation day," hits home. Yet through the wisdom we share in his books, Kephart leaves us a rich legacy of sound education on life in the outdoors.

In contrast to Kephart's beloved mountains, Robert Chester Ruark's milieu was the North Carolina coast in the vicinity of Southport and Wilmington. There he had an idyllic childhood — the kind every red-blooded American kid ought to enjoy — under the knowing tutelage of his grandfather. These wondrous days of youth he later immortalized in two works which many feel are among the finest things American sporting literature has to offer. These books, *The Old Man and the Boy* and *The Old Man's Boy Grows Older,* are collected tales of Ruark's boyhood which first appeared in the pages of *Field & Stream*. The partnership between the "Old Man" (his maternal grandfather, Captain Edward Hall Adkins) and "The Boy" (Ruark) was a timeless one sure to play on the heart strings of anyone fortunate enough to have had close contact with a grandfather in an outdoor setting. What makes it unique is Ruark's subsequent ability to share the nostalgic wonder of those elusive days of youth with an enthralled audience.

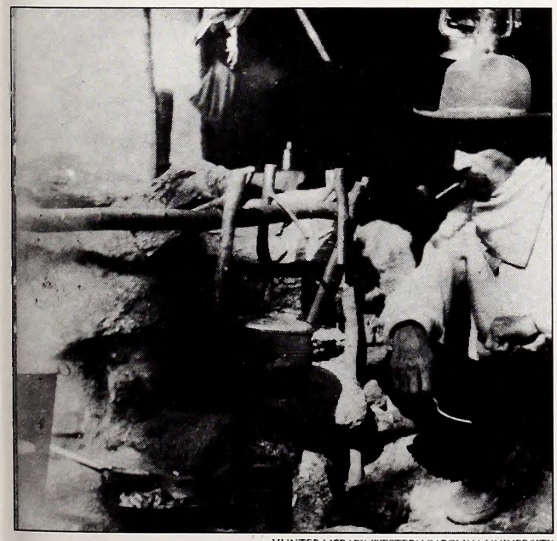
As he writes in an engaging author's note introducing *The Old Man and the Boy*, "Anyone who reads this book is bound to realize that I had a real fine time as a boy." We join him in those fine times and in so doing absorb a goodly dose of the dry wit, homespun philosophy, and endless store of nature's lore which was the Old Man's stock in trade. As Ruark wrote of this endearing figure, "He knows pretty well everything," and what a reader's joy it is to tag along as the Boy learns the ropes of not only outdoor life but life in general. Anyone who can read Ruark's rollicking story, "Life Among the Giants," without laughing must be a truly miserable soul, while "But Not on Opening Day," dealing with his grandfather's death, is certain to bring tears to even the steeliest of eyes. Such was Ruark's gift, and I suspect much of the enduring appeal of his autobiographical tales comes from the fact that he recaptures for us precious moments of our childhoods as well as his own.

Be that as it may, Ruark went a long way in a short time after the Old Man's death. That death





***Known as the** "Dean of American Campers," Kephart wrote several books and many articles about camping and woodcraft. He advocated the creation of a national park in the Smokies, although he was killed in an auto accident before the park became a reality in 1936.*



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came when The Boy was 15 (and, as the Old Man had promised, not on opening day). Well before his 16th birthday Ruark was an undergraduate at Chapel Hill. Following the completion of his B.A. in journalism in 1935, he was, in rapid-fire succession, a reporter, a merchant seaman, an accountant, and by 1938, a married man. Journalism was his real metier, however, and by World War II's conclusion he was well on his way to fame and fortune.

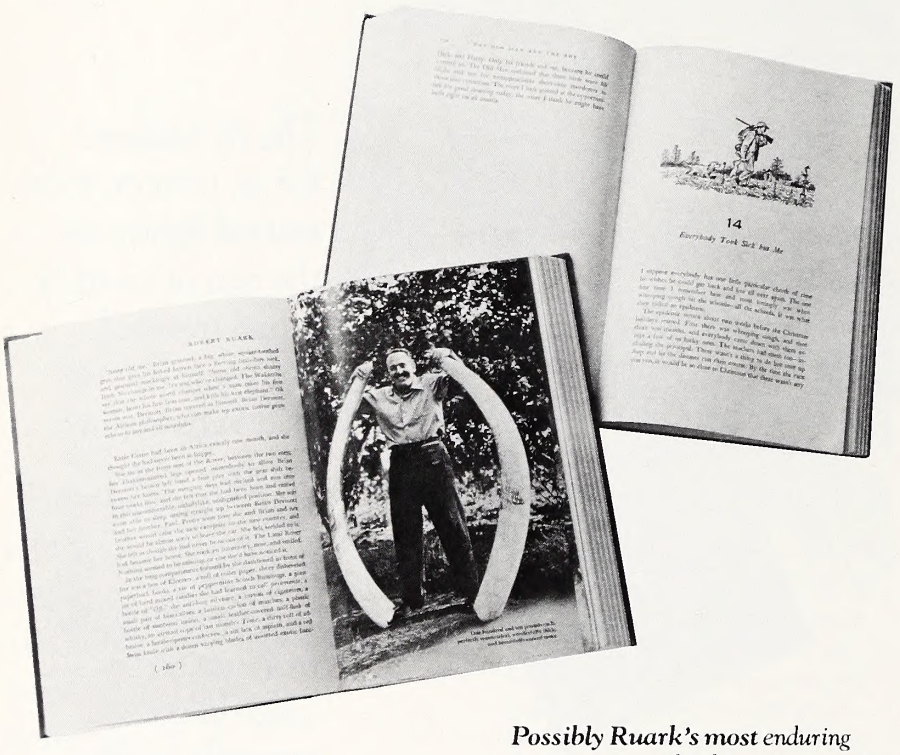
Over the ensuing years he would produce upwards of 4,000 columns, totaling some 2.8 million words, and he was anything but the "pretty ordinary hack" of his self-description. In the late 1940s and early 1950s he wrote a number of books, most of them humorous parodies of the fashionable lifestyles of the day's rich and famous, but it was when he turned to sporting literature that he struck a truly responsive chord with readers. He had always admired Hemingway (the two looked remarkably alike and Ruark sometimes styled himself "the poor man's Hemingway"), and an African safari led to the publication, in 1953, of *Horn of the Hunter.* A blockbuster novel set in the Mau Mau rebellion in East Africa, *Something of Value*, followed in 1955, and it made Ruark a very rich man.

The next few years were his most productive, although he was punishing liquor (and his liver) unmercifully. This was the period, in the mid- and late 1950s, of the "Old Man" tales, and subscribers of *Field & Stream* anxiously awaited the latest episode each month. As a collection, the stories are

The fly hovered for an instant, then settled lightly on the rim of an eddy. It had traveled but a few feet on its downstream journey when there was a flash of silver, a splash, and a gasping sigh from an angler — a sigh drowned instantly by the whine of the reel. Another Cataloochee rainbow made for the fast water.

— *Hunting and Fishing in the Great Smokies* (1948), by Jim Gasque

Writers Of The Purple Prose



SOUTHERN HISTORICAL COLLECTION, UNC-CH

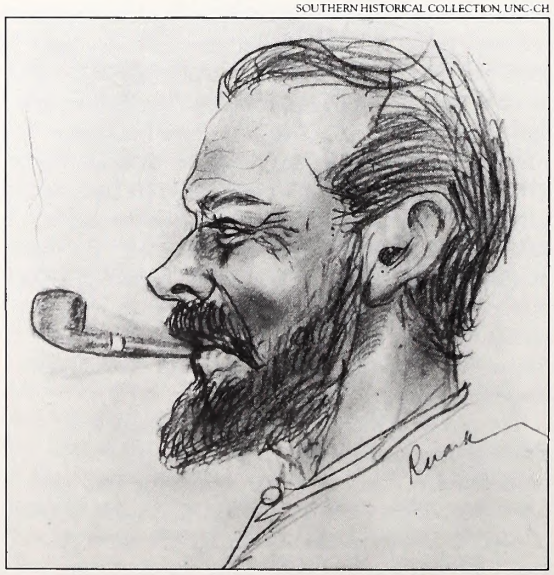
***Robert Ruark went** on safari to Africa to set the scenes of some of his most famous novels. He began humbly as a newspaperman and struck it rich as a syndicated columnist and writer of sporting books.*

There is not much personal adventure left in this world — not many boyhood dreams that lose nothing, but rather gain, by fulfillment. So I combined two dreams in one; I was on a safari and I was going to write about it.

— *Use Enough Gun* (1966), by Robert Ruark

***Possibly Ruark's most** enduring prose was penned in his magazine tales of growing up in eastern North Carolina. Collected in* The Old Man and the Boy, *the autobiographical stories starred his maternal grandfather, here depicted in a sketch by Ruark.*

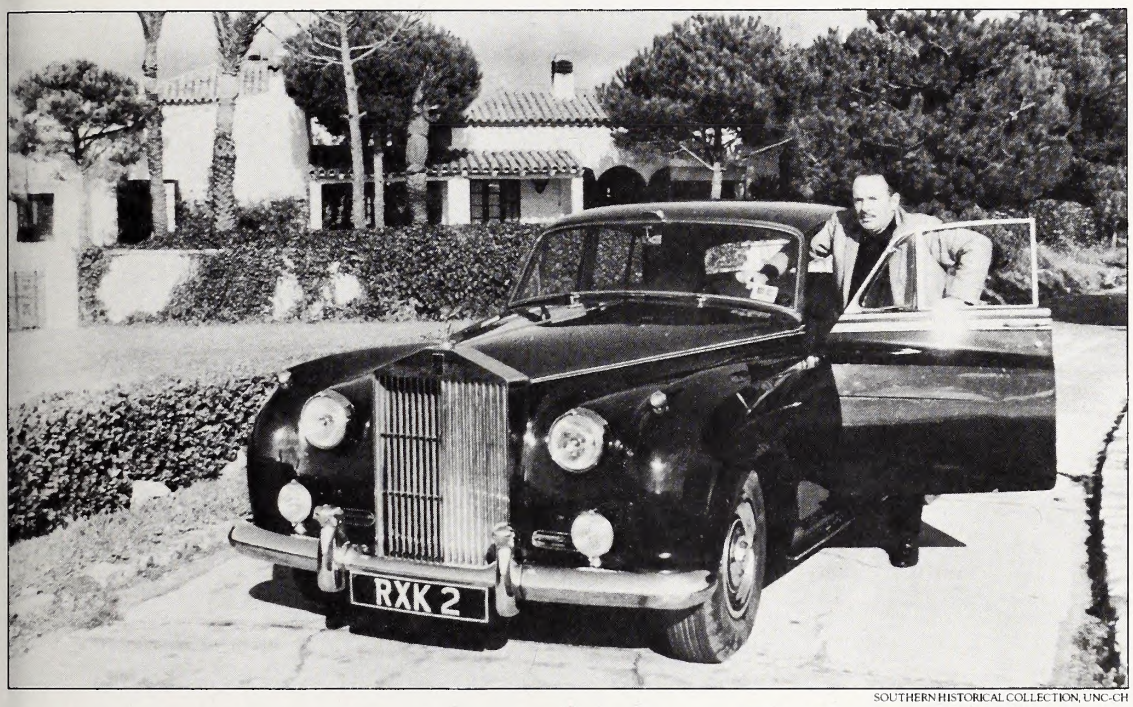
SOUTHERN HISTORICAL COLLECTION, UNC-CH



eminently readable and have an enduring appeal. Spicy, liberally sprinkled with Ruark's pithy language and his vivid recall of both earthy aphorisms and the salty characters who uttered them, the stories range from belly laughing jocularity to tragedy. In all of them, however, the Old Man dispenses his wit and wisdom, tinctured by doses of practical philosophy, on the outdoors and life in general. The stories were and remain a treat — fine and timeless fare to be tasted again and again. Also, while Ruark once said, "I don't evaluate myself as a heavy thinker," through the medium of the Old Man he dispensed a great deal of deep thought.

Unfortunately, he ignored much of the fine advice the Old Man proffered. He was, quite simply, drinking himself to death, even though he continued to be incredibly productive at the typewriter. Three further major novels, *Poor No More* (1959), *Uhuru: A Novel of Africa* (1962), and *The Honey Badger* (1965) added to his fame and fortune. Also, he completed the manuscript of yet another African hunting book, *Use Enough Gun: On Hunting Big Game*, which was published posthumously in 1966. Meanwhile, his marriage had fallen apart, and he sought to become a "new Bob Ruark" at a sumptuous villa he had bought in Spain.

The Boy had traveled a long, winding path since



SOUTHERN HISTORICAL COLLECTION, UNC-CH

***To pull his** life together after his marriage fell apart in the 1960s, Ruark moved to Palamos, Spain, where he bought a sumptuous villa (background) and lived the life of a celebrity.*

SOUTHERN HISTORICAL COLLECTION, UNC-CH

***In France,** Ruark returns from one of his frequent nights on the town. Like many writers of his day, Ruark drank heavily. He eventually died of drink in London.*

the delightful days of his youth on the Carolina coast, but he paid a heavy price for his supposed progress. In the summer of 1965, just short of his 50th birthday, Ruark's liver simply gave out and he died in a London hospital, with his fiancee, Marilyn Kaytor, at his bedside.

Ruark once confided to a friend: "I started out to be a man . . . glad, sad, occasionally triumphant." In the sense that posterity is the better for the metamorphosis that made The Boy an international literary figure who shared his yesteryears with the world, Bob Ruark was triumphant. He left every lover of nature, every hunter and fisherman, indeed, every reading North Carolinian, a bountiful legacy. We are infinitely richer for his hundreds of articles and four books on the sporting life, and it is these works, rather than his novels, which will be Ruark's lasting monument.

Both Kephart and Ruark were all too human in their frailties, but their joint efforts are ones which every Tar Heel who loves the sporting life should both admire and read. They are two giants among America's 20th-century writers on outdoor subjects, and to know their books, especially those with a North Carolina setting, is to have a fuller, richer appreciation of what it means to be a sportsman. ⊠

The Old Man used to say that the best part of hunting and fishing was the thinking about going and the talking about it after you got back. You just had to have the actual middle as a basis of conversation and to put some meat in the pot.

— *The Old Man and the Boy* (1953), by Robert Ruark

BIRD PHOTOGRAPHY TODAY

The standards of quality are changing, and so are cameras and film. If you want to shoot great photos of birds, here's what you need to know.

by Joel Arrington

Photos of birds in magazines and books today are vastly superior to those of just a few years ago. One reason is there are so many new photographers. As one might expect, a small percentage is exceptionally skilled. Few become full-time professionals, but many of the best contribute to magazines, books, calendars and other markets.

Technical improvements making cameras easier to use and less expensive have no doubt lured new hobbyists over the last 20 years, but that does not entirely explain why bird pictures have improved so much. Maybe it's because photography in the '70s became trendy, a new wave art form for the masses. With interest in and concern for the environment, many young people took their cameras, now lighter and more automatic than ever, to the beach, to backyards, woodlots, and fields, if not to the wilderness. A few of these neophytes became practiced and highly accomplished as a matter of course and the result today is generally higher photo quality in publications.

When I was a writer and photographer for this magazine in the early 1960s, a flash shot of a bird family at a nest was much admired. That kind of picture today is passe. Flash shots of diurnal subjects still sell, but editors everywhere have come increasingly to expect photos of all but nocturnal birds to be exposed with natural light or by expert simulation of it. Flash may be used as long as it does not detract from the illusion that

JOEL ARRINGTON

***An itchy neck** is no problem for this long-legged little blue heron. Modern photographers favor such shots because they show birds in interesting poses. Blinds are not always necessary near docks where birds are more accustomed to people.*

JOEL ARRINGTON

A small crab *makes a tasty meal for this little blue heron feeding in an appealing setting. The photographer should try to capture such moments of natural activity. It takes patience, skill, and sometimes a bit of luck.*

JOEL ARRINGTON

Close-up of black skimmer *was shot with a 400mm telephoto lens. A rock-steady tripod and careful focus are an absolute necessity for such shots. Full-frame close-ups are often employed when the background is likely to be uninteresting.*

The place to start bird photography is at a feeder. You can erect a blind there, place a camera on a tripod for remote operation, shoot out a window to a feeder nearby, or employ a combination of these techniques.

the picture was made with natural light. Mere portraits of birds are less desirable than depiction of behavior — animals doing something illustrative of their natural history.

Nature photographers made their own portable blinds 20 years ago. Now an entire industry caters to their needs, and vendors advertise blinds and other special equipment in a national magazine for outdoor photographers. Newsletters circulate exclusively to nature photographers and countless workshops are held in attractive wild places across the country.

Cameras got better in some ways as electronics crept into design. They are lighter now because they contain less metal and more plastic. Exposure meters built into cameras are much more sophisticated and may produce more good exposures than just a decade ago. Automatic exposure is better than it was at first, but still inferior to the experienced photographer's eye and judgment. With color transparency film, exposure is so critical that relatively few frames exposed automatically are likely to meet the highest standards. Good photographers shoot in the automatic mode only when they have to.

The use of computers has speeded up lens design and reduced production costs. Competition among exclusively foreign manufacturers (nearly all are Japanese and German) has further reduced prices so that high-quality telephoto lenses are more affordable. A strong dollar against the yen over much of the last 20 years has brought down prices even more on Japanese products. The situation reversed and the dollar fell to all-time lows in 1987, which will likely escalate the cost of equipment wherever it is made. Bird photography with short to medium telephoto lenses requires more patience and ingenuity than money. The best long lenses — over 300 mm — are still quite expensive and more difficult to use.

The place to start bird photography is at a feeder. You can erect a blind there, place a camera on a tripod for remote operation, shoot out a window to a feeder nearby, or employ a combination of these techniques. When other food is plentiful, birds may not come frequently to a feeder. Winter is the best time, but at any season you should study the birds' preferred food list and provide whatever is most desired by the species you want to photograph. Cardinals and some of the finches, for example, prefer black sunflower seeds over the striped variety. Peanut butter or suet attract several species and the food can be packed into cracks and smeared on inconspicuous spots within your set. Some shots may be made less appealing, however, by bits of food on the birds' bills.

The goal in most animal photography is to depict the subject in an unsullied, natural setting doing something illustrative of its usual habits as if it were unaware of the camera's presence. Often that is exactly the case, but at other times photographers' attempts to achieve that illusion are elaborate.

You can practice shooting birds on a feeder, but you will soon want to substitute some natural perch or build a set. Spring flowers are good, but you can use a dead limb even in summer to simulate winter conditions. If you employ cut flowers, be sure to tape a small water bottle like a test tube to the stems. Otherwise they will soon wilt. For a while, birds will return to the location even when you take the feeder away. Suddenly discovering they have no other place, birds are prone to perch in your set. You want to arrange the elements so that they have only one place to go and that is precisely where you want them for the picture. This sounds easy, but is difficult in practice.

A direct, head-on photo of a bird is not often pleasing. You want a quarter or profile view usually, and from the bird's level. Most of all, you want to catch the bird in suspended animation, not just perched there with an eye cocked at the camera. Good shots require repeated attempts and plenty of patience.

Most photographers use the shotgun technique to some degree. They may have a good idea of what the aperture and shutter speed, angle of view, lens and lighting should be, but they also bracket. They shoot frames over and under the "correct" exposure and at different angles and with different lenses so if their best guess at all the variables is not exactly right, they may still get some good frames. However, the photographer who knows from experience and can precisely calculate what his choices should be will get a much higher percentage of good pictures, other factors being equal, because often nature photographers get only one chance at the really appealing shot.

***The fact that** this great crested flycatcher (below) has just captured a meal makes this a better photograph. The indigo bunting amid morning glories (right) may not illustrate any particular activity, but the mix of colors improves the photograph. Both photos were shot by Steve Maslowski, a skilled and prolific bird photographer.*

STEVE MASLOWSKI

You want to catch the bird in suspended animation, not just perched there with an eye cocked at the camera. Good shots require repeated attempts and plenty of patience.

"Depth of field" or "focus" is the area of the photo, front to back, that is in acceptably sharp focus. The more you stop a lens down — close the diaphragm — the deeper that area of sharp focus will be. Depth of field with slow films and small subjects is likely to be limited, so you need to arrange the perch parallel to the film plane to get as much of it and the bird in focus as possible. Avoid having a major element of the set project toward the lens because that part will be out of focus. Better that out-of-focus elements be in the background. Focus on the bird's eye — or your best guess at where it will be when the bird arrives. A plain, out-of-focus background with plenty of light on it is usually best. If you shoot against a bank of trees, all in shadow, your shot will look like a nighttime photograph even if there is plenty of light on the set.

This kind of bird photography may be done with even a wide angle lens. (Normal lenses take in about what human eyes see. Wide angles take in more, telephotos less.) Birds will learn to tolerate a camera close to a feeder if you gradually move up a little box with a phony lens. With the camera in position, you may observe the birds at a distance and trip the shutter with a solenoid or radio. Remote photography, however, is more feasible in medium or large format and black and white work than in the 35 mm color format. Framing may be wider if you can enlarge, but must be tight in 35 mm, since you are working with a piece of film the size of a postage stamp. Precise framing and observation of composition at the moment of exposure is not always possible with remote operation.

Telephoto lenses make the work easier, but even a 200 mm lens, for example, must be close to the subject. Many 200s have minimum focusing distances of about 6 feet, which would produce a moderate image size for most backyard birds. Longer lenses may be positioned farther from targets. My 400 mm will focus to about 14 feet.

Recent improvements in telephoto lens design result in sharper images, better color and faster focusing. Automatic focusing has already made major inroads into mass photography markets. Manufacturers of advanced telephoto lenses recently redesigned many of them to accept small motors in preparation for widespread use of automatic focusing, still a few years in the future for professional photographers.

A long tele is next to worthless without a sturdy tripod, according to Jack Dermid of Wilmington, one of the state's most experienced bird photographers. He recommends a fluid head — but one made for motion picture cameras — and bean bags for the camera and lens to steady them even further.

"It just depends on what you are trying to do," he pointed out. "If you are shooting in bright sunlight at 1/500th on the beach, you can get by with an ordinary tripod; but if you are in the woods trying to shoot a squirrel at 1/30th, you've got to have solid support. Not many are willing to spend $500 or more for a tripod," he added, "but that's what the good ones cost."

Leonard Lee Rue III, one of the world's most successful nature photographers, recommends ball heads. A lens attached to one can be moved in any direction and quickly locked down hard. The best ball heads for heavy lenses are imported and cost up to $300.

For inspiration in bird photography, go to the library and look up the work of Allen Cruikshank in the 1940s and 50s. A more contemporary photographer, and one who has been often published in this magazine, is Karl Maslowski. His sons, Steve and Dave, are admirably emulating their father's career.

While not having yet produced the volume of work of some of the others, Canadian Tim Fitzharris — still a young man — has done some of the continent's most innovative and artistic bird photography. His *The Adventure of Nature Photography* (1983), was a Canadian best seller and but one of five books on natural history he has written and illustrated. *Audubon* magazine used his pictures on its covers four times in one year.

All these people have at least one thing in common: high standards for their photographs. They expect only a percentage of their efforts to produce images worth keeping. After days in the field and long weary hours in blinds and waders, when the boxes of slides come back, nearly every frame goes into the trash. They recognize the difference between a mere record of a bird and a compelling image of one. ⊠

***A male anhinga** (left) suns himself in this gracefully composed photograph shot with a telephoto lens from a blind. A black-necked stilt (below), rare in North Carolina, uses a broken-wing display to decoy the photographer away from the young, creating an interesting pose and reflection. Wildlife photographers, Leonard Lee Rue III and his son, captured these birds on film.*

LEONARD LEE RUE III

Eight-Point Bucks Battled

Deer Hunter Finds Match For Broken Antler

Written and Edited by Mark Taylor

Wildlife biologists tell us that whitetail deer rarely fight to the death. This being the case, the story that I'm about to recount certainly defies all odds. It has been 24 years now since the unusual story unfolded, but it is no less astounding to me today than when I first saw and heard it as a child.

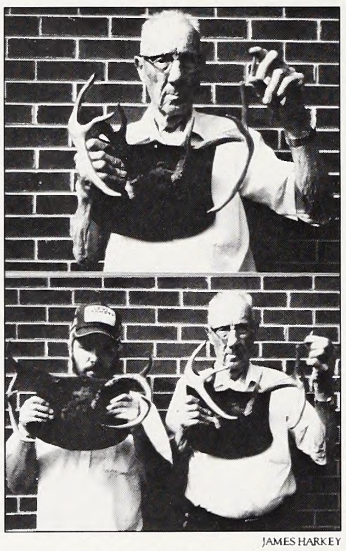
It was a cold November day in 1963 when the late Bob Harkey made his way to his deer stand in the Blue Ridge Cove section of western North Carolina. Here, in the shadow of Mount Mitchell, Harkey had bagged several deer. On this last day of the buck season he hoped to get a chance at one of several big bucks that had been seen in the area.

At about 11:30 that fateful morning, Harkey left his stand to return to the car to eat lunch and warm-up. As he was making his way down the mountain he heard a dog bark a short distance away in the thick rhododendron. Dogs were not allowed to run deer on game-management land, but were occasionally used for bear hunting.

Anticipating that the dog might have jumped a deer, Harkey ran to a narrow clearing where he would be afforded one quick shot. Just as he reached a "slick" where logs had been dragged down the mountain, the buck ran into view about 70 yards away. A quick but perfect shot dropped the eight-point, 155-pound buck.

Harkey returned home to dress the deer and remove the antlers. While removing the rack, a small puncture was noticed between the base of the antlers. Upon investigating the wound, the top of another deer's antler was found wedged under the skin and against the skull. The deer apparently had been in a fight and had survived a serious wound. Harkey and his companions — Bob Turner, Dick Turner and Euray Lawing — discussed the rarity of this discovery, and how interesting it would be to see the deer that this buck had fought. Of course, none of the hunters ever expected to do so.

Two weeks later, while participating in an either-sex deer hunt in the same area, Dick Turner came upon the carcass of a large buck. He made his way through a thicket to get a better look at his find. He immediately became very excited. The dead deer had a large, beautiful eight-point rack. Its only flaw was that it was missing the tip of an antler. Turner wondered if this could be the deer they had all wanted to see so badly. The deer's body was marked by several scrapes and cuts with the death blow apparently coming from a puncture wound to the left rib cage. Near the dead deer was an area which Turner describes as the scene of "a tremendous fight." The ground was pawed and torn by hoofs where two deer had battled gallantly. The battle scene was some 200- to 300 yards down the ridge from where Harkey had killed his eight pointer just two weeks before.



JAMES HARKEY

A Rare Find: *Deer seldom fight to the death, but on the slopes of Mount Mitchell several hunters found a pair that did. Above, Dick Turner holds a rack with the tip of one antler broken off. Below, Tim Harkey stands with the rack of a deer shot nearby — the hunters had discovered the broken antler tip embedded in this deer's skull. When they put the two together — a perfect fit!*

Anxious to verify his suspicions, Turner returned to Lincolnton to reveal his find to his hunting buddies. Dick and Bob Turner and Bob Harkey returned to the area the following day with the broken tip from Harkey's deer's skull. There was a deep sense of anticipation as they worked their way to the deer. When they reached the carcass no one spoke as Harkey slowly fit the 2-inch antler tip to the broken tine of the dead deer. Dick Turner described it best. "They ain't no doubt about it! That's it — a perfect fit!" The jig-saw puzzle fit verified the highly unlikely incident.

The 86-year-old Mr. Turner has seen a lot of unusual things in his many years in the outdoors. He has killed over 60 deer, eight elk and three antelope across the United States. He says, "This is the most unusual experience that I can recall."

— *James Harkey*
Lincolnton

Cook Bear, Boar Meat Well Done

If you're fond of eating bear or wild boar, cook it well. Over the past decade, at least 113 human cases of trichinosis in the United States have been attributed to eating wild game. In the lower 48 states, two species were responsible — black bear and wild boar. In Alaska, walrus is also a source of the disease.

A mid-1970s survey of over 450 bears taken from 10 states showed that about 3 percent of the animals carried trichinosis. The parasite which causes the disease infects the muscle tissues. In the past trichinosis was often found in domestic swine, but strict meat inspection has virtually eliminated this source of the disease.

Fortunately, trichinosis can be prevented. Simply be sure to cook all bear and boar meat until it is well done — this kills the parasite. Even if the meat is infected, it is safe to eat if it is thoroughly cooked. Also, avoid feeding dead animals or parts of carcasses to pets or livestock to prevent them from contracting the disease.

Calendar Of Events

Jan. 22-24
First Annual Carolina Fishin' Show at the Metrolina Fairgrounds in Charlotte. Booths, demonstrations, lectures and equipment displays dealing with many types of fishing.

Jan. 23
North Carolina Chapter of the Wild Turkey Federation annual convention at Asheboro High School in Asheboro. Begins at 9 a.m. Calling contest, exhibits by manufacturers of turkey calls and other hunting equipment, meeting and other events.

Fish The Long Pools

Upper French Broad River Best Spot For Muskies

Where can a muskie find an ideal home? The French Broad River comes close, according to a recent survey of muskie habitat in North Carolina.

"Muskie like long, slow-moving pools with structure such as tree laps, sunken logs, or rocks," said Jim Borawa of Asheville, mountain region fisheries research coordinator for the Wildlife Commission. "We surveyed our muskie habitat in North Carolina recently as part of our management program, and found that the upper French Broad River (between Penrose and Asheville) has the most and best habitat. Eighty-three percent of this section of river is suitable habitat for adult muskies.

"This particular stretch of river has the cool water, good water quality, and long, slow pools that muskie need," added Borawa. "In addition, there was plenty of cover. Muskies hunt from ambush in quiet water, and generally lie alongside a log or tree lap and dart out to seize their prey as it goes past."

KEN TAYLOR

Finding Trouble: *Fisheries biologists recently found that the upper French Broad River has the best muskie habitat in the state. Muskie fishing remains good through the winter and into the spring.*

The New River is also good muskie water. A total of 48 percent of the habitat was suitable for the fish. "This river has less cover and a steeper gradient than the upper French Broad," said Borawa, "so it's not as good a muskie stream as the upper French Broad. These fish need to utilize as little energy as they can in hunting because they're a high-level predator."

The lower French Broad River and the Nolichucky River system (including parts of the North Toe and Cane rivers) contained a limited amount of good muskie habitat. Faster water and a lack of cover were the limiting factors.

Field Notes

Season openings, closings, and regulation changes:

- Deer:
  - ⋆ Eastern gun deer season closes Jan. 1.
  - ⋆ Central gun deer season closes Jan. 1.
- Western bear season closes Jan. 1.
- Wild boar season closes Jan. 1.
- Gray and red squirrel season closes Jan. 30.
- Rabbit season open through Feb. 29.
- Quail season open through Feb. 29.
- Grouse season open through Feb. 29.
- Pheasant (male birds only) season open through Feb. 1.
- Western raccoon and opossum season closes Jan. 30.
- Eastern raccoon and opossum season open through Feb. 29.
- Woodcock season closes Jan. 4.
- Common snipe season open through Feb. 27.
- Dove season closes Jan. 9.
- Duck season closes Jan. 16.
- Sea duck season closes Jan. 16.
- Snow goose season closes Jan. 30.
- Canada goose season closes Jan. 16.
- Brant season closes Jan. 16.

Check *Regulations Digest* for information on season boundaries, bag limits, and other regulations. Copies of waterfowl regulations are available from license agents.

Wildlife A National Obsession

Enjoying wildlife is a national pastime. A recent survey conducted by the U.S. Fish and Wildlife Service found that approximately 141 million adult Americans participate in some form of wildlife recreation, and spend about $55 billion annually on these activities.

The 1985 National Survey of Fishing, Hunting and Wildlife Associated Recreation showed that 46.6 Americans, roughly one in four, fished in 1985, and about 16.7 million Americans (one in 10) hunted. Approximately 109 million Americans also participated in such non-consumptive wildlife activities as bird watching and wildlife photography. Many of these individuals also hunted and fished, however.

This survey is conducted by the U.S. Fish and Wildlife Service every five years, and is used to monitor changes and trends in outdoor recreation.

Cape Fear Yields Big Cat

Big cats are roaming North Carolina, and the place to find them is in our waters. In fact, a state record blue catfish was recently caught from the Cedar Creek area of the Cape Fear River.

The fish weighed 54 pounds, and was 44 inches long with a 28-inch girth. It was caught on a live sunfish by Ronald Boahn of Fayetteville. The lower Cape Fear is known for producing big catfish.

"How-To" For Handicapped Hunters And Anglers

New Magazine Serves Disabled Sportsmen

A recent article by Terry Shankle on handicapped sportsmen (*Extra Effort Outdoorsmen*, March '87 issue) resulted in several inquiries asking where information could be obtained on outdoor recreation for the disabled.

Fortunately, a new outdoor magazine fills this need. *Disabled Outdoors* is published quarterly, and articles focus on how disabled sportsmen may enjoy hunting, fishing, camping, canoeing and a host of other outdoor activities.

"I first started thinking about this project in 1981 when I was hit by a car and suffered serious leg injuries," said John Kopchik, editor and publisher of *Disabled Outdoors*. "I spent the next two years in a wheelchair undergoing physical therapy. I'd always been an avid hunter and fisherman, and wished to continue. I found, however, that there was virtually no information available on outdoor recreational opportunities for the disabled."

The first issue of *Disabled Outdoors*, published in January 1987, was a 16-page newsletter. However, the publication quickly grew to a 24-page magazine with a circulation of over 10,000 subscribers in the United States and Canada.

"We try to act as a combination outdoor magazine and clearinghouse for the disabled sportsman," said Kopchik. "We run articles on outdoor hunting and fishing resorts and camping areas that are wheelchair accessible or have special facilities for the disabled. We also publish how-to articles, usually by disabled sportsmen, on how they are able to continue to enjoy the outdoors. In our past issues, for example, we published articles on quadriplegics who are able to hunt and canoe. We also report on special equipment that can be made or is available, and list events that may be of interest."

Subscriptions to *Disabled Outdoors* are available for $8 annually from *Disabled Outdoors* magazine, 5223 South Lorel Ave., Chicago, Illinois 60638 (tel. 312-284-2206). Information is available from the same address.

The 1988 North Carolina Wildlife Calendars Are Here!

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CALO 88

Book Reviews

A Field Guide to the Atlantic Coast Fishes of North America. 326 pp., softcover. $14.95. Available in most bookstores. Published by Houghton Mifflin Company, Two Park St., Boston, Mass. 02108.

This is the latest in the series of Peterson Field Guides, and encompasses the salt water fishes of the Atlantic Coast. Like the other Peterson field guides, this publication is well-done, easy to use, and includes an excellent series of color plates.

The Marsh Hen, A Natural History of the Clapper Rail of the Atlantic Coast Salt Marsh by Brooke Meanly. 118 pp., softcover. $8.95. Published by Cornell Maritime Press, P.O. Box 456, Centreville, Maryland 21617.

The marsh hen or clapper rail is a bird of the salt marsh, and is found throughout the length of the Atlantic Coast. The author explores the range, habits, nesting and behavior of the birds.

Ducks Are Great Guests For Dinner

The gray days of winter are dear only to duck hunters, and there's no better reward after spending a cold day afield than eating the results. Here are two simple but delicious recipes for cooking ducks. Wild Roast Duck was provided by Susan Sharpe of Hamlet, and the recipe for Duck in Orange Juice was contributed by Jim Dean, editor of this magazine.

Wild Roast Duck

4 ducks
½ lb. bacon
2 apples
2 oranges
1 onion

Place ducks, breast down in roasting pan. Place apples and oranges, cut in half around duck. Place ¼ onion in each duck and lay bacon slices on top. Cover top of pan with lid or foil. Cook slowly at 250° for 2½ hours.

Duck In Orange Juice

apples
celery
onions
4 or 5 slices bacon
salt
1 cup orange juice

Salt inside of duck carcass and stuff with equal mixture of coarsely chopped apples, celery and onions. Sew shut to keep stuffing inside. In a large roaster or dutch oven with lid — fry 4 or 5 slices of bacon. When nearly crisp, remove bacon and brown duck in bacon fat. Add 1 cup orange juice or enough to cover bottom of pot about ½ inch. Drape bacon over duck, reduce heat to simmer, and cover. Turn duck occasionally basting with liquid in pot. Cook a large duck 45 minutes to 1 hour; small ducks take only 30 minutes. Remove duck when done, slice meat, and pour reduced pot liquid over meat.

"Hey Teach, What Color Is A Bluebird?"

New Wildlife Coloring Book Will Help Teachers

Thanks to a contribution from American Telephone and Telegraph, North Carolina educators involved with the Wildlife Commission's Project WILD program have a new teacher's aid — a coloring book.

The coloring book was designed for the Wildlife Commission as an extension of the Project WILD program. Artist Anne Marshall Runyon of Raleigh designed the book which includes drawings of wildlife in their native North Carolina habitats. The book was printed as a public service by AT&T.

Project WILD is a program endorsed and sponsored by wildlife and natural resources agencies nationwide to help school teachers in grades kindergarten through 12 with their lessons by providing a series of interesting activities relating to the environment.

These activities may be used in biology, language skills, science and other classes. The coloring book is an excellent complement to Project WILD activities in the elementary grades.

The 40,000 copies of "North Carolina's Colorful WILD Places" are being mailed upon request to educators in the state who have attended Project WILD workshops.

"With habitat and natural resources being so important in our state, this coloring book will be a great tool for teaching young people," Gov. James G. Martin said as he was presented the first copy of the book. Commission Chairman Eugene Price of Goldsboro and Mrs. Runyon joined AT&T's B.C. Morrow Jr. in the presentation of the book to the governor.

North Carolina began using Project WILD in 1984. The Commission's Division of Conservation Education teaches 1,500 educators annually in Project WILD workshops. Those educators use Project WILD activities to help teach many different subjects. More than 150,000 students are being taught each year with the assistance of the Project WILD program.

"One of our retired wildlife officers, Jim Renegar, originally had the idea for the coloring book as a result of his interest in helping to spread the conservation message to young people," said Sid Baynes, chief of the Commission's Conservation Education Division. "We took Jim's idea and tied it to the Project WILD program to develop our coloring book. AT&T thought it was a worthwhile project, so they donated money and time and actually printed the coloring book in their facilities."

Coloring books are available to teachers who have completed a Project WILD workshop.

— *Angela Hill*

ANGELA HILL

WILD Reading: *North Carolina Governor James Martin was recently presented with the first copy of* North Carolina's Colorful WILD Places *— a coloring book that supplements Project WILD and shows North Carolina wildlife in their native habitats. The publication was a joint project of the Wildlife Commission's Division of Conservation Education and AT&T. From left to right are Eugene Price of Goldsboro, chairman of the Wildlife Commission, Governor James Martin, Annie Runyon of Raleigh, a well-known nature artist who drew the illustrations for the coloring book, and B.C. Morrow Jr. of Charlotte, assistant vice-president for external affairs of AT&T.*

The Wildlife Endowment Fund Report

The Wildlife Endowment Fund is supported by the sale of lifetime licenses, lifetime subscriptions to *Wildlife in North Carolina*, and tax-deductible contributions. Only the annual interest from this fund is used for wildlife conservation, and the fund will play a key role in supporting wildlife programs in the future. Interest is earned through investments made by the State Treasurer's Office. For more information, write to the Wildlife Endowment Fund, N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27611.

Status on October 31, 1987

	Numbers Sold	Revenue Received
Lifetime Sportsman's License	43,814	$13,522,445.00
Lifetime Hunting License	276	58,867.37
Lifetime Fishing License	3,274	567,892.97
Lifetime Subscriptions to Wildlife in N.C.	1,212	151,276.94
Contributions	—	93,986.15
Fund Total		$14,394,468.43
Total Interest Earned	$2,209,051.51	

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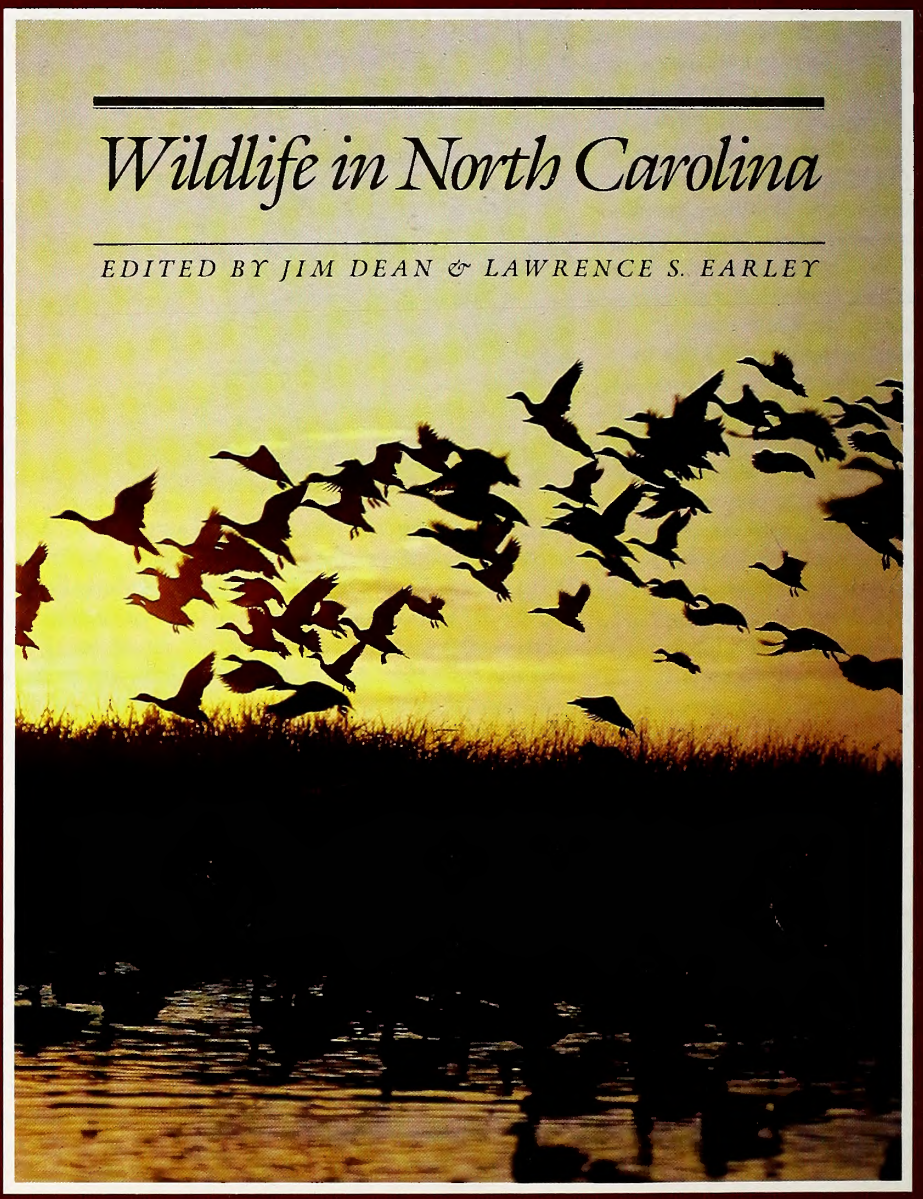

Wildlife in North Carolina celebrates the North Carolina outdoors . . . its sporting traditions, wildlife, history, and land. It's a collection the whole family will treasure. And with the holidays approaching, it makes the perfect gift.

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The future of wildlife and the recreation it provides depends on each of us. Your lifetime license or lifetime subscription to *Wildlife in North Carolina* will support the Wildlife Endowment Fund and help assure that future.

Carolina Gentleman

A bobwhite quail warms itself in a patch of late winter sunlight, but thick cover for a hasty escape is nearby.

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At The Tip Of Your Nose

by Jim Dean

As is the case with most of us who have achieved what we all hope is no worse than the mid-point in life, I am beginning to notice a few physical changes. For one thing, my arms seem to be getting shorter. I used to be able to tie a tiny trout fly on a wispy leader with ease. Now I can barely stretch my arms far enough to get this business in focus. I'm also a bit forgetful at times, but I can't recall offhand any specific examples.

Nonetheless, I can still see the hairs on an ant's abdomen, or the individual grains of pollen in a blossom. If I like, I can also marvel at the iridescent colors in a rainbow trout's scales or view close-up similar patterns in a bluejay's feather. I owe this almost miraculous faculty to a pair of glass eyes — a 55mm macro lens and a 105mm macro lens which fit the camera I carry with me almost everywhere.

JOEL ARRINGTON

For those who might not be familiar with these photographic accessories, a macro lens not only enables you to shoot photographs at more or less normal ranges, but also to shoot extreme close-ups. Thus, if I see a tiny wildflower, mushroom, insect or other miniscule item of interest while I'm hunting, fishing or just wandering around outdoors, I can set up a sturdy tripod, mount my camera and one of the macro lenses, and take a very close look. Of course, I could do that with a magnifying glass, but with a macro lens, I can also shoot a photograph.

The resulting slide can be viewed with a magnifying glass, enlarged into a big color print, or projected onto a huge screen. Anyone who can't pick out the body hairs on the abdomen of a 4-foot ant is truly blind. Of course, you don't have to get that close to produce a photo with impact.

Let's say, for example, that you have caught a fairly decent trout or bass and you want to record your catch in an appealing manner. With the standard lens available on most cameras, you can't focus very close. Therefore, you put your fish on a clump of moss or an old dock, and stand back to shoot the photo. When you get the photo back from the processor, your prize catch has shrunk drastically. Indeed, unless it was a real whopper, you may even have trouble finding it in the photo.

But with a macro lens, you could move in closer and fill the entire frame of film with your fish. Then, moving still closer, you could shoot just the head with the fly or lure in the fish's mouth. Still not satisfied? Move closer and shoot just the lip of the fish and the tiny fly. I think you get the picture, if you'll pardon the pun.

Even if you don't have a close-up lens, you can improve the photographs you take by reducing the distance between you and your subject. The tendency among most amateur photographers is to try to get everything in the picture. If your son or daughter catches a bluegill, you stand back far enough to get head, feet and half the lake in the photo. The result is usually disappointing. Not only is the tiny bluegill reduced to a dot, you can barely make out your child's smile of triumph.

Instead, try moving much closer. Get your child to hold the bluegill near his or her face, and frame the photograph so that you get only the face and fish. All that busy background will be out of the picture, and you'll have a shot for granny and all the relatives.

If you decide you'd like to shoot the kinds of photographs a macro lens can produce, there are several things you should know. First, as mentioned, a macro lens can also be used as a normal lens, which means that such a lens could serve admirably as your only lens if you're not interested in acquiring a vast amount of equipment. You can opt to buy a macro lens instead of a normal lens when you purchase your camera body, or you can buy a macro to fit the camera body you already own if that body is a decent quality 35mm camera capable of accepting interchangeable lenses.

Perhaps the biggest disadvantage is cost. A macro lens made by a major camera manufacturer — Nikon, Olympus, Minolta, Canon, etc. — is usually considerably more expensive than a normal lens. Zoom lenses with macro capabilities are likely to be even more costly. There are, however, suitable alternatives.

Quite a few companies make far less expensive lenses that are designed to fit a variety of camera bodies, and almost all of these companies also offer one or two macros. Such lenses may not be built to the same exacting standards as those sold by major camera companies, and they may not be as durable. On the other hand, most are surprisingly good and certainly capable of producing high-quality photographs.

What you choose to buy will depend not only upon initial cost, but how you plan to use it. If you're a professional, or perhaps hope to publish some of your photographs, you may be wise to get the best. As with most everything else, you tend to get what you pay for. Still, if you're simply interested in shooting better-quality, more interesting snapshots, the less expensive macro lenses should serve admirably.

If you love the great outdoors, and you want to see more of it in a way that was never possible before, a close-up lens will improve your vision. It's a window open to a new and exciting world. Hey, what else can offer you that guarantee for a couple of hundred bucks or so?

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WILDLIFE IN NORTH CAROLINA

Wildlife in North Carolina is the official educational publication of the North Carolina Wildlife Resources Commission, and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources and the environment we share with them.

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Cover *Groundhogs normally hibernate throughout the winter, but males may come out to seek a mate in nearby dens. Photograph by Leonard Lee Rue III.*

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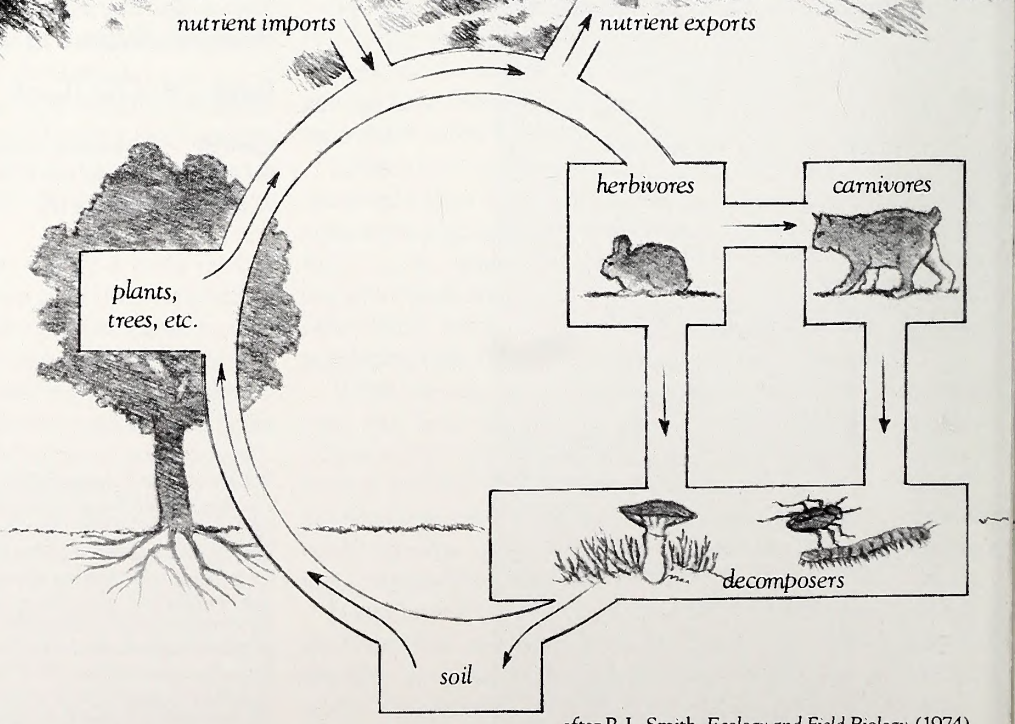
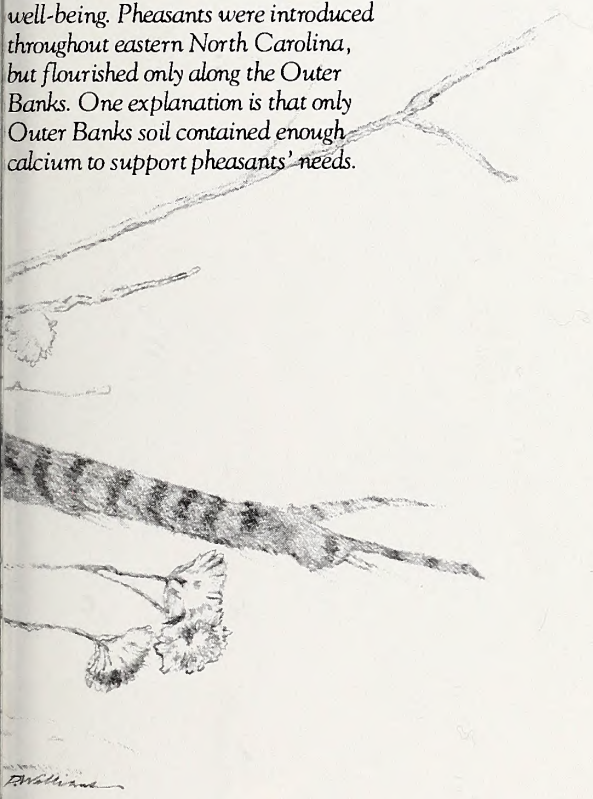


Nutrients flow in *an endless cycle through the ecosystem. As a plant's roots suck up water from the soil, nutrients in the soil are absorbed and make the plant grow. When animals eat the plants the nutrients become part of the animals' bodies and are passed along to carnivores. When plants and animals die, bacteria, fungi and other soil organisms break down their bodies and release the nutrients for use by plants once more.*

The nutrient cycle is not a closed circuit, however. Nutrients can enter the ecosystem from outside by rainfall, for example, and leave when a tree or a deer is harvested.

after R.L. Smith, *Ecology and Field Biology* (1974)

This symbolic illustration *demonstrates the chemical bond between the pheasant and the soil in which its food grows. Wildlife and plants grow and reproduce only when they have nutrients essential for their well-being. Pheasants were introduced throughout eastern North Carolina, but flourished only along the Outer Banks. One explanation is that only Outer Banks soil contained enough calcium to support pheasants' needs.*



The Nutrient Chase

written by Lawrence S. Earley / illustrated by David Williams

Leave it to biologists to put us in our place. "Temporary nutrient pools" — that's what they sometimes call living things, including you and me. It's a humble perspective from which to look at ourselves. Nutrients, of course, are those elements — calcium, nitrogen, potassium, etc. (see box) — that make things grow. But nature doesn't use nutrients one time and then discard them. They are used over and over again, stored in this day lily, that black bear, that good-looking blonde, before being returned to the soil. Hence, temporary nutrient pools.

If there is a beginning to this cycle, it's in the soil, for that's where nutrients are made available to plants. That's where the long journey begins. And if a soil is missing certain nutrients, the effects on plants and wildlife are often profound.

Since the 1940s, for example, there have been many attempts to introduce ring-necked pheasants into North Carolina as a potential game species. The most recent attempt was in the late 1970s in several coastal counties. But the bird failed to survive anywhere except along the Outer Banks, where they still exist today. Biologists have explained this failure in various ways, a lack of suitable climate being just one explanation.

Another explanation is that the predominantly sandy and red clay soils of the state possess little of the calcium that pheasants need. Only along the Outer Banks, where deposits of seashells over the years have added calcium to the soil, do plants satisfy the nutritional requirements of the pheasant.

For similar reasons, North Carolina's white-tailed deer are much smaller and have less impressive antler growth than deer found in other parts of the country. Once again, a lack of calcium and phosphorus in the soil is the culprit. Hunters know that different areas may offer widely differing nutrition to animals, depending upon the soil. The alluvial soils of the Roanoke River bottomlands, rich in nutrients, support larger deer with heavier racks than the sandy, nutrient-poor soils of the Sandhills.

Life in a freshwater stream is also linked to the presence of nutrients and, ultimately, to the soil. One study showed that 134 trout streams in the Smokies contained an average of 18 pounds of trout per acre while a Pennsylvania stream carried 268 pounds of trout per acre. The difference lies in the soil the streams flow through. The Pennsylvania stream drains calcium-rich limestone that supports abundant plant life crawling with aquatic insects — trout food. Trout streams in the Smokies, on the other hand, flow through nutrient-poor quartzites, slates and gneisses. The streams support fewer aquatic plants, fewer insects — and fewer trout.

Acid rain is a major threat to many of our mountain streams precisely because it further reduces nutrients already in short supply. Some lakes in New York's Adirondacks are virtually lifeless today because of this problem.

The nutrients in the soil are key components to habitat. They play a crucial role in determining not only the kinds of plants and animals that live in the habitat, but their size and their health.

Essential Nutrients

All plants and animals need nutrients for healthy growth. The following nutrients are considered essential. Macronutrients are those needed in greater quantity than micronutrients.

Macronutrients	*Micronutrients*
carbon	*iron*
hydrogen	*manganese*
oxygen	*zinc*
nitrogen	*copper*
phosphorus	*molybdenum*
sulfur	*boron*
potassium	*cobalt*
calcium	*vanadium*
magnesium	
chlorine	

Groundhogs have *traditionally served purposes far more useful than any dubious foretelling of spring's arrival. Many groundhog "products" are linked to Southern Appalachian history, some still in use. Shown clockwise from the top: a fresh groundhog hide, native American medicine drums with heads made from groundhog hide, shoes with groundhog hide shoelaces, pint of rendered groundhog grease, and old-time fretless banjo with head made from groundhog hide.*

LEONARD LEE RUE III

WHISTLEPIG WHIMSEY

The groundhog may not predict weather, but what other varmint-hunter's delight can provide banjo heads, shoelaces, hand lotion, cough medicine and a tasty meal?

by Doug Elliott©

Shoulder up your gun and whistle up your dog,
We're gonna hunt for the ole' groundhog
Oh Groundhog!

So goes the first verse of an old traditional song — a jocular folk litany of praise and thanksgiving for this pert member of the squirrel family. The groundhog is found from north Georgia through the mountains and most of the Piedmont of North Carolina, and north into Canada. Even in these modern times groundhogs provide a valuable — and surprisingly varied — resource for country folks who live traditional lifestyles. Many legends and a sizable body of folklore also surround groundhogs.

One afternoon I saw my mountaineer neighbor, Lyge, treading up the path to my cabin. He seemed to be leaning to one side as though he were carrying something heavy in one hand. As I greeted him at the door, he flopped his load on my doormat. It was a freshly killed fat groundhog!

"Doug, didn't you say you was a'wanting one of these critters?" he asked.

Indeed I had. After hearing my neighbors reminisce about catching groundhogs in the old days, and raving about how delicious roast groundhog tastes, I had figured I might get invited to a groundhog supper. I'd mentioned that I'd like to try one, sometime. It seemed that "sometime" was now. My groundhog supper had just come to me!

Meat on the table, butter in the churn,
If that ain't groundhog I'll be durn
Oh Groundhog!

Lyge instructed me on skinning and cleaning the beast. He told me to remove the scent kernels from under the forelegs.

"Save that hide," said Lyge. "Thar's lots of uses for a groundhog hide. A young, thin groundhog hide makes a good banjo head." I allowed as how I was glad to know that but I didn't have any banjos under construction.

"Well then make you some shoelaces," he said. "Groundhog hide makes the best shoelaces there ever was!"

He explained that all I had to do was put the well-scraped hide in a dishpan covered with wood ashes and water. In a couple of days the hair would slip off and I could tan the hide by working it over the back of a chair until it was soft, dry and flexible. The hide could then be cut into long spiral strips to make the laces.

"In the old days we made all our shoelaces out of groundhog hide," said Lyge. "You can't hardly break 'em!"

We'll eat the meat and save the hide,
Makes the best shoe strings you ever have tied
Oh Groundhog!

I was intrigued, and determined right then and there not only to clean and cook that groundhog, but to try working the hide into shoelaces. As Lyge was stepping out the door, he said, "Don't forget to render out the grease."

"The grease?" I asked. "What would I do with that?"

"Groundhog grease makes good medicine," he said. "We always use it when the young'uns take the croup. I've took many a spoonful of it when I was coming up. Now thar's things I've had that tasted better, Buddy, but it'll help ya'."

Now I was *really* intrigued. Lyge left me to my task, and I trimmed masses of fat from the meat and carefully rendered it over low heat in a skillet. It yielded almost a quart of grease that was as clear as store-bought cooking oil. I put it in small jars as gifts for my neighbors. I was amazed at the many uses they related when they received the jars, especially since groundhog oil is strictly a homemade product. One neighbor uses it as a liniment for rheumatism. Another uses it as a skin conditioner to prevent chapping in cold weather. One family mixes it with Vicks Vap-O-Rub for coughs and chest afflictions. (They swear the Vicks doesn't work nearly as well without the groundhog grease.) Still another person uses it to soften leather.

Here comes Sally with a snicker and a grin,
Groundhog grease all over her chin
Oh Groundhog!

It amazed me to think of how a rodent most people think of as little more than a destructive varmint has been highly valued for so many years not only as a food source, but also as a source of shoelaces, cordage, banjo heads and a number of medicines.

That particular groundhog yielded a lot of grease because it had spent the summer feeding heavily on tender wild greens, fruit, acorns and garden produce. By late September, when he was killed, he had accumulated a thick layer of fat to carry him through the winter while hibernating in his burrow.

A groundhog's burrow is a masterwork of ingenious excavation. The main entrance is usually under a rock, stump, or a building, and this prevents dogs, foxes or irate gardeners from digging him out too easily.

Here comes Sally with a 10-foot pole
Gonna twist that whistle-pig out of its hole.
Oh Groundhog!

LEONARD LEE RUE III

Until the early *1970s, groundhogs were common mostly in the western mountains and foothills of North Carolina, but their populations have spread east throughout much of the Piedmont, and some are even found in the Coastal Plain. Farmers generally consider them pests because they construct burrows in fields, and sportsmen who like to hunt them are often welcomed.*

The main entrance is easily recognized by a large heap of excavated dirt piled in front of the hole. The tunnel may reach as deep as 6 feet beneath the surface in soft ground, but in rocky soil it may be less than 3-feet deep. Its total length may be from 10- to 40-feet with as many as five alternate emergency openings. These side doors have no tell-tale dirt piles because they are dug from within, and are usually well concealed with brush or tall grass. Inside the tunnel, various chambers serve as toilets and bedrooms. To protect from flooding, the sleeping chamber is usually in the highest part of the tunnel. Sometimes its roof is within 2 feet of the surface of the ground.

We'll dig down but we won't dig deep,
We'll find that whistlepig where he sleeps.
Oh Groundhog!

The groundhog is a true hibernator. A fat individual may begin its winter sleep before the first frost. Curling up into a ball, it drops into deep sleep, breathing once every six minutes. The heart rate drops to four beats per minute, and the animal's temperature may drop as low as 38 degrees Fahrenheit, and remains this low the entire winter. It would take several hours for it to awaken even if it were taken to a warm place. The thick layer of fat sustains the groundhog until spring, and when it finally awakens, it will have lost as much as one-half of its body weight.

In considering groundhog lore, we can't forget February 2, Groundhog Day. I've searched my calendars and can assure you there's no 'possum, 'coon, squirrel or fox day — only Groundhog Day. It has always seemed mighty peculiar to me that this animal, which for all intents and purposes should be sound asleep in its burrow during this coldest time of the winter, should have a day in February to commemorate its being.

But it turns out that Groundhog Day marks the halfway point between Winter Solstice and Spring Equinox, and is the last remnant of an ancient pagan celebration of the return of the light — rebirth and renewal. Some pre-Christian civilizations demonstrated a deep spiritual connection with the earth and its cycles, and even early mankind living in the northern hemisphere realized that early February in the apparent heart of winter marked a time when days get longer and the light and warmth begin to return.

Some Christian sects refer to February 2 as "Candlemas," and celebrate it as a time to melt down all candle stubs and make new candles — a return to the light. In rural folklore, it has often been said that if you still have more than half your firewood (or stored food) on Groundhog Day, you'll have enough to last until spring.

Ancient legends aside, what is any self-respecting groundhog doing out in February anyway? It's the heart of the cold weather, the ground is frozen, and there is little greenery to eat.

One bright blustery day after a February snowfall, I headed to the woods near my Yancey County home. I was hiking along the mountainside when I found paw prints with distinctive fingers. Raccoon, I thought, until I looked more closely. The front feet had only four toes, a raccoon has five.

I was on the trail of a groundhog! What was a groundhog doing out in the snow? I followed the animal tracks around the mountainside where they led to a burrow. The snow was trodden down at the entrance, and I could see where the animal had entered and then exited, staining the snow for a yard or two with its freshly muddied feet.

I followed as the tracks led on around the mountain arriving at the mouth of another, separate den. Again, I could see where it had walked into and departed from this hole. The snow was packed and disturbed at the mouth, but those same muddy footprints had entered and left, continuing around the mountainside. Eventually those tracks led me to the mouths of seven different dens. I never saw any sign of feeding, and later learned that I had observed the curious act of a male groundhog looking for love in all the right places. Those tracks were most certainly those of a lusty young boar looking for a mate.

A Cherokee Indian friend told me that when the male groundhog arrives at a female's den, he rapidly pounds his feet at the entrance and whistles. If his intended is receptive, she will come out and greet him. This same Indian told me that when he was a youngster, he would go into the woods during those hungry months of February and March, and creep up to a groundhog's den. Then, he would drum his fingers on the earth in front of the den and whistle. If he could lure the female out, he greeted her with a swift blow from a stout stick and brought her home for supper. He was highly praised by his family for being cunning enough to bring home meat during those months of scarcity.

Cherokees and other tribes believe that the groundhog yields important medicine because of the animal's intimate knowledge of herbs, fruits and healing plants. Its flesh provides sacred food and its hide is used to make moccasins and medicine drums. Indians see the creature as an intermediary between Grandmother Earth and Grandfather Sky because it spends half the year deep within the bowels of the earth, yet when it emerges from the depths it looks skyward and has the whistle of the high flying eagle.

This shrill explosive whistle gives the groundhog its nickname of whistle-pig, a colloquialism common throughout the southern mountains. The Algonkian word for groundhog is "wujak," a name corrupted by English speakers to "woodchuck," and this is what groundhogs are called in most of the northern states and Canada.

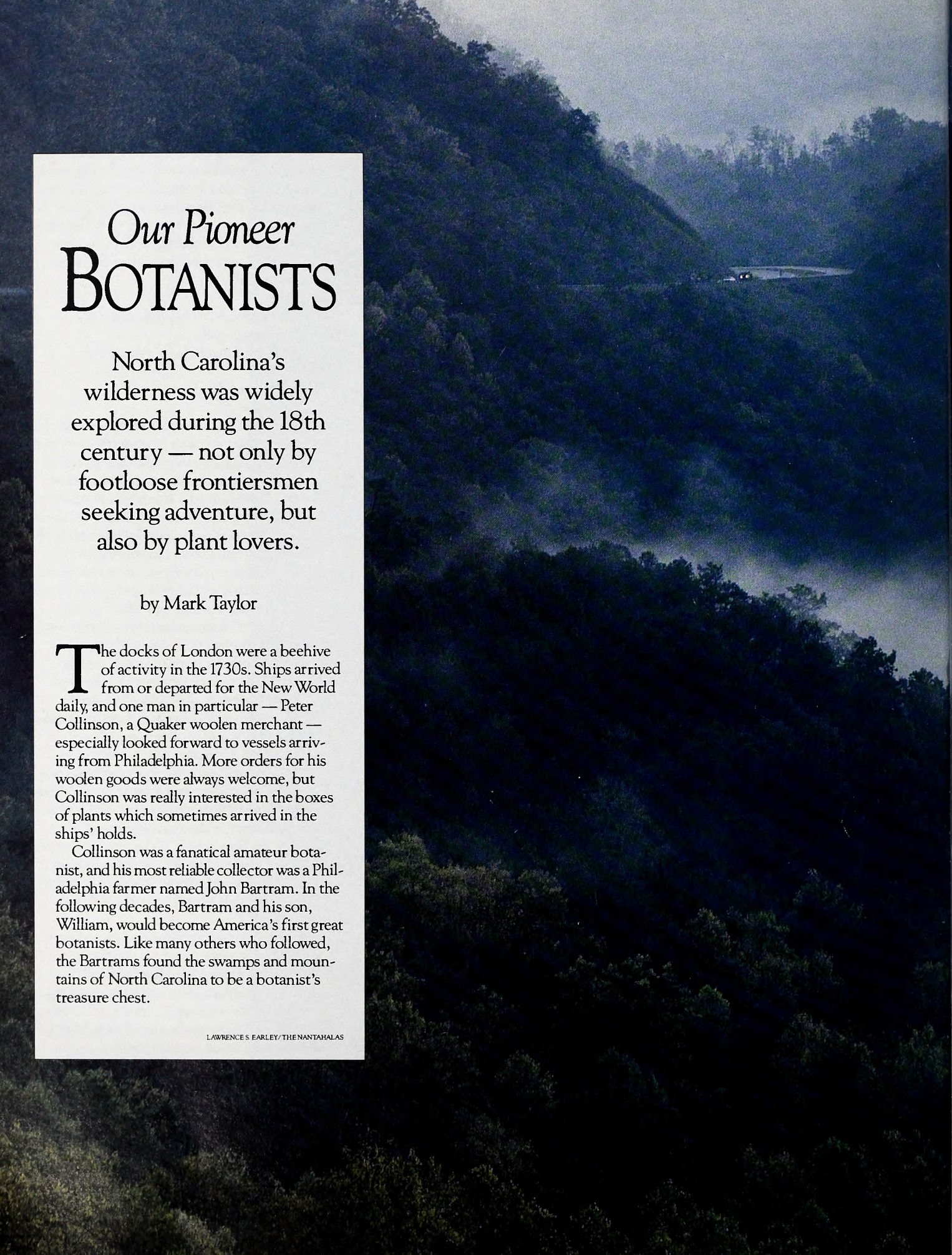
Woodchuck, whistle-pig, call him what you will,
We'll sell that hide for a two dollar bill.
Oh Groundhog!

Of course, the most famous legend about the groundhog is how it emerges from its den on Groundhog Day to predict the arrival of spring based on whether it sees its shadow or not. This is actually an ancient myth that comes down to us from early European bear and badger cults that viewed the life cycle of hibernating animals as a metaphor for the human spiritual journey — winter being the time of death and darkness and spring being the time of rebirth and new life. Through all the days of summer the animal is accompanied by its shadow — its dark side. This shadow lengthens as autumn arrives, and soon the creature must return to the earth. When it enters the darkness of the underworld, it loses its shadow and there it remains, inert and formless until it is ready to be reborn. When it emerges, if a portion of its old shadow still adheres, the rebirthing process is not complete and it must go back into the earth until not a trace of the old shadow remains. Thus, if the groundhog sees its shadow on February 2, we say we can expect six more weeks of winter. Settlers arriving in the New World adapted the groundhog to this ancient cult legend, and it is still with us today.

Perhaps you are wondering how my first groundhog supper turned out that sunny September afternoon. After Lyge left, I parboiled the meat with spicewood twigs and bay leaves, then put it on the grill over some hot hickory coals, and brushed a dab of barbecue sauce on each piece.

Little bit of cornbread lying on the shelf
If you want any more you better sing it yourself.
Oh Groundhog!

Yes indeed, that whistlepig was delicious.



Our Pioneer BOTANISTS

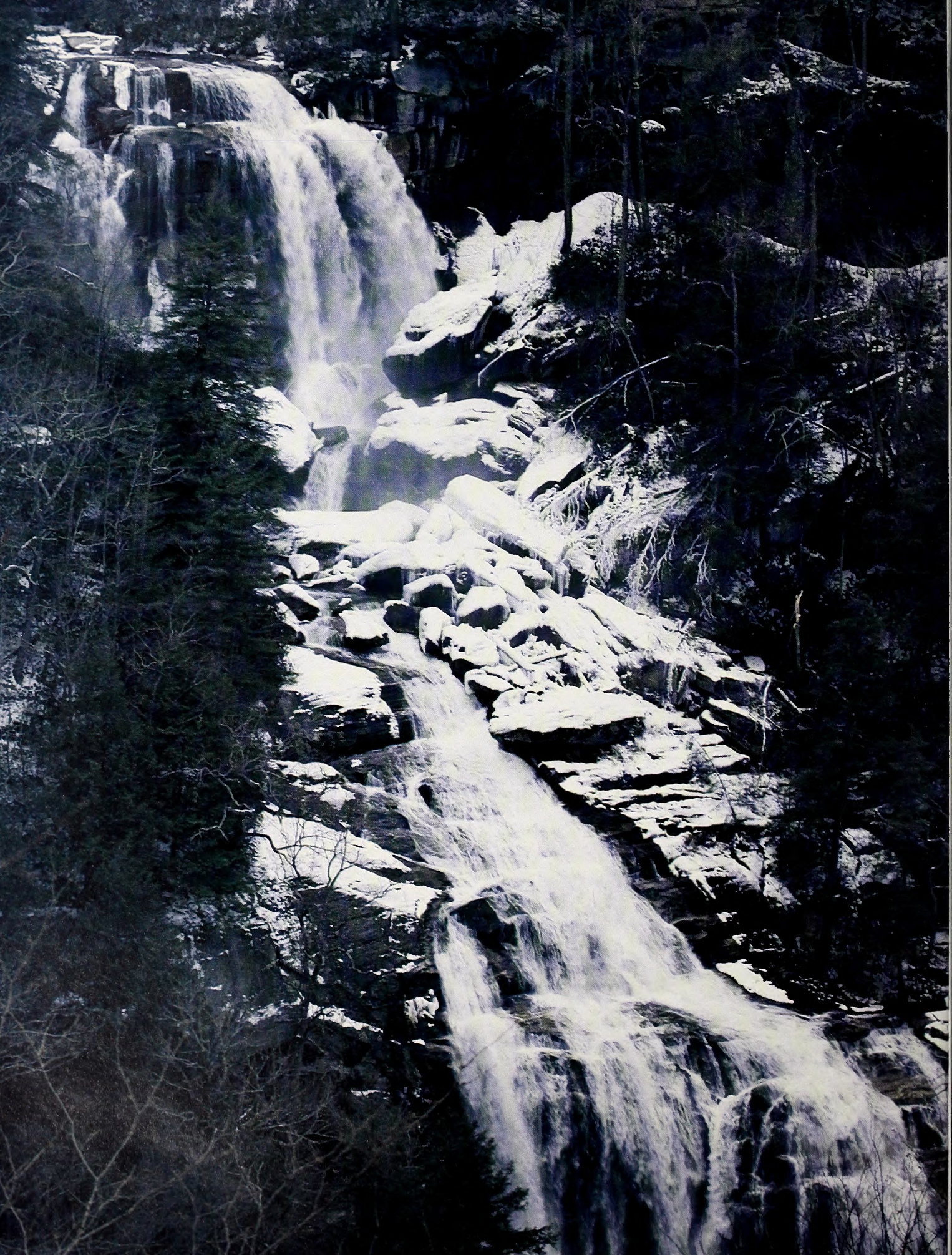
North Carolina's wilderness was widely explored during the 18th century — not only by footloose frontiersmen seeking adventure, but also by plant lovers.

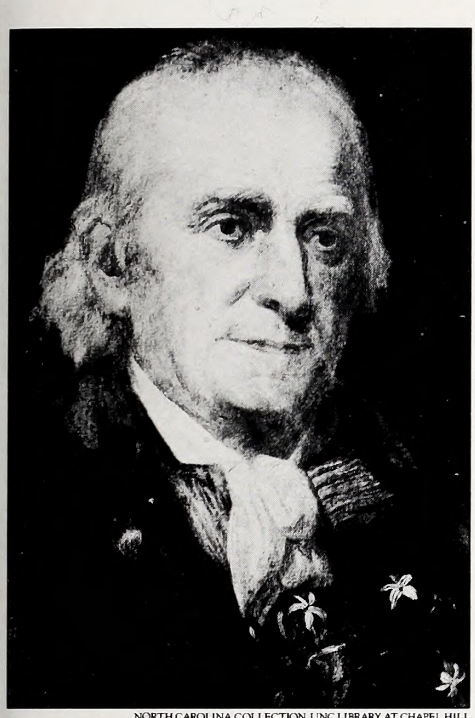
by Mark Taylor

The docks of London were a beehive of activity in the 1730s. Ships arrived from or departed for the New World daily, and one man in particular — Peter Collinson, a Quaker woolen merchant — especially looked forward to vessels arriving from Philadelphia. More orders for his woolen goods were always welcome, but Collinson was really interested in the boxes of plants which sometimes arrived in the ships' holds.

Collinson was a fanatical amateur botanist, and his most reliable collector was a Philadelphia farmer named John Bartram. In the following decades, Bartram and his son, William, would become America's first great botanists. Like many others who followed, the Bartrams found the swamps and mountains of North Carolina to be a botanist's treasure chest.

LAWRENCE S. EARLEY/THE NANTAHALAS





NORTH CAROLINA COLLECTION, UNC LIBRARY AT CHAPEL HILL

William Bartram 1739-1823

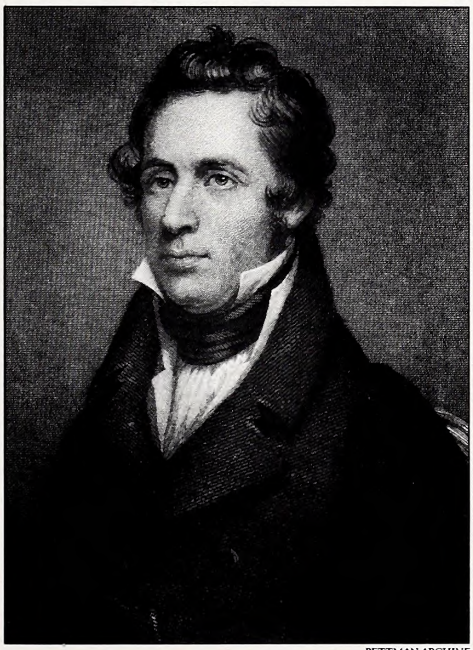
The elder Bartram was born near Philadelphia in 1699. Even as a boy he was deeply interested in plants, and became a self-taught botanist while managing his family's farm and raising 11 children. At a time when many men never ventured more than a few miles from their homes, Bartram took long collecting trips in the fall and winter after the year's crops were harvested.

Bartram ultimately built a thriving business supplying plants and cuttings for natural gardens to the British aristocracy, and in the 1760s he was named colonial botanist to the King. He received a generous stipend to finance his studies and ranged the length of the East Coast, visiting North Carolina several times. In 1765, he and William, then 22 years old, took a botanical field trip from Wilmington south along the coast to Florida, eventually ascending the mouth of the St. John's River. It was John Bartram's last extended trip, and he spent the rest of his life writing and tending the extensive botanical garden he had established on his farm.

Although John Bartram loved botany, he always feared that his son William would neglect financial security to follow the wild. His fears were well founded. In spite of giving his son a good education and establishing him as a storekeeper at Cape Fear, North Carolina, the younger Bartram frequently neglected his business to roam. The store failed, as did a later indigo plantation he owned in Florida. In 1773 he gave up on business, and left on a four-year exploration of the great rivers, swamps, and mountains of the Southeast. He moved freely among the villages of the Creek, Seminoles and Cherokee, who called him "Puc Puggy" — the Flower Hunter. The Indians considered Bartram slightly crazy, but harmless. He spent the last two years of the trip among the Cherokee in western North Carolina, emerging only to mail letters and plant specimens to his father.

Bartram developed a serious eye infection, however, and returned to Philadelphia in January 1777. His father died the following fall, leaving William his beloved botanical garden. William Bartram tended and expanded the famous gardens until his own death at the age of 84. Perhaps his greatest influence, however, was in literature. In 1791 he published *Bartram's Travels*, an account of his five-year journey. His poetic description of the American wilderness was a best seller in Europe, and descriptions of the Nantahala Mountains and the limestone caves of Florida inspired several passages in Samuel Taylor Coleridge's poem, "Kubla Khan."

The Bartrams weren't the only botanists prowling the mountains of western North Carolina in the late 18th century, however. They were followed a few years later by another father-and-son team — Andre and Francois Michaux of France.



BETTMAN ARCHIVE

André Michaux 1746-1802

Andre Michaux was 39 when he stepped ashore in New York in 1786, bearing a commission as botanist to King Louis XVI. The monarch was deeply interested in agriculture and natural history and wished to find new plants to decorate the grounds of his palace at Versailles. He was especially interested in finding trees — particularly oaks — suitable for shipbuilding that could be replanted in France. The forests of France

LAURA MANSBERG

Michaux's Lily

Here terminates the great vale of Cowe, exhibiting one of the most charming natural mountain landscapes perhaps anywhere to be seen; ridges of hills rising grand and sublimely one above and beyond another, some boldly and majestically advancing into the verdant plain, their feet bathed with the silver flood of the Tanase, whilst others far distant, veiled in blue mists, sublimely mounting aloft with yet great majesty, lift up their pompous crests and overlook vast regions."

— William Bartram in Nantahala Mountains, May, 1776

ROB SUTTER

Shortia

This is the most primitive country I have seen, primitive in everything. The remotest hidden parts of Wisconsin are far in advance of the mountain regions of Tennessee and North Carolina. But my host speaks of the "old-fashioned unenlightened times," like a philosopher in the best light of civilization. "I believe in Providence," said he. "Our fathers came into these valleys, got the richest of them, and skimmed off the cream of the soil. The worn-out ground won't yield no roastin' ears now. But the Lord foresaw this state of affairs, and prepared something else for us. And what is it? Why he meant us to bust open these copper mines and gold mines, so that we may have money to buy the corn that we cannot raise."

— John Muir's journals
September 17, 1867

had been depleted during the wars with England, and good timber was scarce. Michaux's mission was to find these plants and also to tighten the bonds of friendship between the two countries. He went at both tasks assiduously, first visiting William Bartram in Philadelphia and then moving to Charleston, South Carolina, and establishing a residence and nursery at a nearby plantation.

Charleston was to be Michaux's base for the next 11 years as he traveled as far north as Hudson Bay, Canada, and as far south as Florida. Much of his collecting, however, was done in the mountains of western North Carolina, especially near the Horsepasture River and north through the Smokies to Mount Mitchell and Grandfather Mountain.

Michaux was accompanied on these trips by a handful of Indian guides and occasionally his teen-age son, Francois. He, too, was afraid for his son's future, but after later schooling in France, young Michaux would become one of Europe's great natural scientists. He would return to America in the early 1800s to collect the plants of the Ohio River valley, and in 1815 he would publish *North American Sylva*. This book described the trees and woods of America and was the first to call for the sound conservation and management of its rich forests.

Two of Andre Michaux's finds created botanical mysteries. A species of yellow-flowered magnolia collected near the North-South Carolina border was not found again for 150 years. Another, a small, galax-like wildflower found a little farther north — later called shortia — would not be rediscovered in the wild for nearly 90 years.

The search for the missing shortia was undertaken by America's greatest 19th-century botanist, Dr. Asa Gray. The Harvard professor found the strange plant in 1840 while searching through Michaux's extensive plant collection in Paris. Both Michauxs were dead, and Gray was confused by the notes left with the specimen. Gray named the unknown plant shortia after a friend, Dr. Charles Short of Kentucky.

Gray undertook several lengthy expeditions to North Carolina to search for shortia. He combed the tops of Grandfather, Mitchell and Roan mountains, but his best efforts failed to produce the diminutive wildflower.

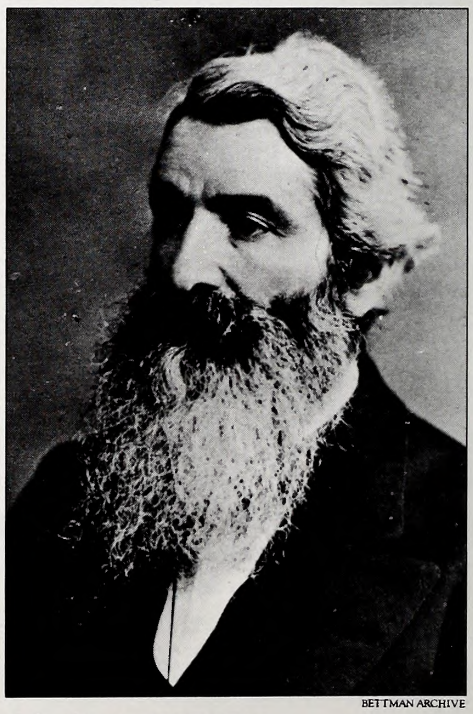
Shortia was finally discovered in 1877 by 17-year old George Hyams. The plants were growing along the banks of the Catawba River near Hyams' home in Marion. The boy showed the strange flower to his father, an amateur botanist, who sent it to Gray.

However, the original location of Michaux's find remained a mystery until 1887, when it was found by Charles Sprague

BETTMAN ARCHIVE

Asa Gray 1810-1888

Sargeant, also of Harvard. After perusing Michaux's notes, Sargeant believed shortia was found at lower elevations farther south. He discovered the plant at about 1,500 feet in Oconee County, South Carolina, hence its common name, "Oconee Bell." Upon receiving specimens and a description of the location from Sargeant, the 78-year old Gray is said to have wept with joy.



BETTMAN ARCHIVE

John Muir 1838-1914

Perhaps the freest spirit to roam the Carolina mountains in the 19th century was John Muir, who would later found the Sierra

Club and secure Yosemite Valley in California as one of our first national parks. In 1867, the 29-year-old Muir embarked on a thousand-mile journey, mostly on foot, from Indianapolis, Indiana, to the Florida Keys. Recalling this trip years later, Muir told a friend, "I might have become a millionaire, but I chose to become a tramp."

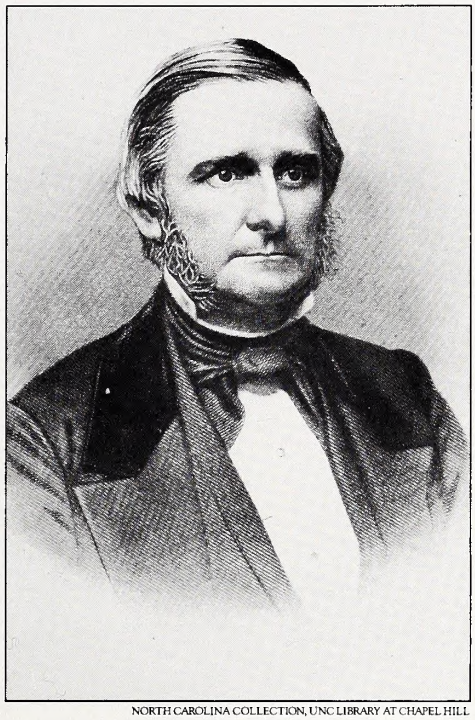
Muir's walk took him through the heart of the southern Appalachians. He ascended the mountains near Kingston, Tennessee, passed due south through North Carolina's Cherokee County, dallied awhile in Murphy, and then traveled through the Georgia mountains to Athens.

Although Muir was enchanted by the beauty and natural richness of the southern Appalachians, he was also disturbed by the poverty and backwardness of the region — much of it the result of the ravages of the Civil War a few years earlier. Most of the inhabitants, he noted, had been reduced to making moonshine and collecting ginseng for a living.

Despite their poverty, Muir found the mountain people hospitable. On one occasion he stayed with a family whose neighbors were engaged in a feud. Each night, one of the feuding men — armed to the teeth with knives, a brace of pistols, and a long rifle — would come in for supper after dark, quickly eat, and disappear. A bit later, the neighbor he was feuding with would appear to eat, also heavily armed. The host was trying to make a peace between the two because both were good men, and neither could tend their farms to grow food they needed while hiding in the woods to avoid ambush.

Other less well known botanists also made substantial contributions in North Carolina. John Lyon, an English nurseryman from Charleston, made frequent trips into the North Carolina mountains from 1799 until he died of typhoid fever in Asheville in 1814. He was seeking new varieties of rhododendron and other plants for his nursery business and introduced 31 native plants into American and European horticulture.

Perhaps Lyon's greatest contribution, however, was the encouragement he offered Silas McDowell, a native North Carolina botanist. McDowell was a boy when he watched Lyon catalogue plants in Asheville, and soon he was accompanying Lyon on long trips through the mountains, studying the geology and plant life of the region. He was 19 when Lyon died, and he grew up to become a tailor and clerk of court in Macon County. More important, perhaps, he also built a large collection of rhododendrons, and corresponded with and frequently guided the leading botanists of his day. In later years McDowell became especially interested in horticulture, and he developed many new varieties of apples and grapes suitable for cultivation in western North Carolina.



NORTH CAROLINA COLLECTION, UNC LIBRARY AT CHAPEL HILL

Moses Ashley Curtis 1808-1872

Moses Ashley Curtis, a Hillsborough clergyman, was another outstanding North Carolina naturalist. Curtis was originally from Massachusetts, but he had worked as a tutor for a wealthy Wilmington family during the 1830s and was fascinated by the plant life of the south. Following his ordination as an Episcopal minister in 1839 he moved to Hillsborough. He remained in Hillsborough until his death in 1872 but traveled widely on field trips. Although he was a dedicated clergyman, he also became the nation's leading authority on fungi and mushrooms. He collected and found edible (after careful testing) 40 mushrooms within two miles of his home. He also worked for the North Carolina Geological Survey as a botanist and zoologist from 1860 to 1862, and his published list of North American plants — including fungi and mushrooms — totaled 4,800 species, the most complete list of the day.

Many other naturalists — such as Thomas Nuttall, Dr. Elisha Mitchell, and John Catesby — also made important contributions to North Carolina's natural history. The wild, deserted country that drew these men is largely gone, lost to the gradual development of farms, towns and cities. But most of the botanical riches they discovered here still remain, waiting to be enjoyed by anyone with a day pack and a few field guides. ⊠

ROB SUTTER

Gray's Lily

The pride and indolence of our nature blind us to a thousand beauties because they are apparently small and insignificant, yet which humility and attention would disclose, and overwhelm us with astonishment and delight. Indeed it is in more minute objects of creation that we can expect to find new and ever increasing subjects of wonder, for extended variety is not to be sought in that which is vast. Variety of form and habit is endless and when the student has spent a life in their examination he finds that he has hardly stepped upon the threshold of this wide world of wonders.

— *Moses Ashley Curtis letter, 1834*

Small Game As A Crop

Farmers and rural landowners can do a lot to improve wildlife populations on their land, especially species like quail and rabbits. Here's how.

by Terry Sharpe

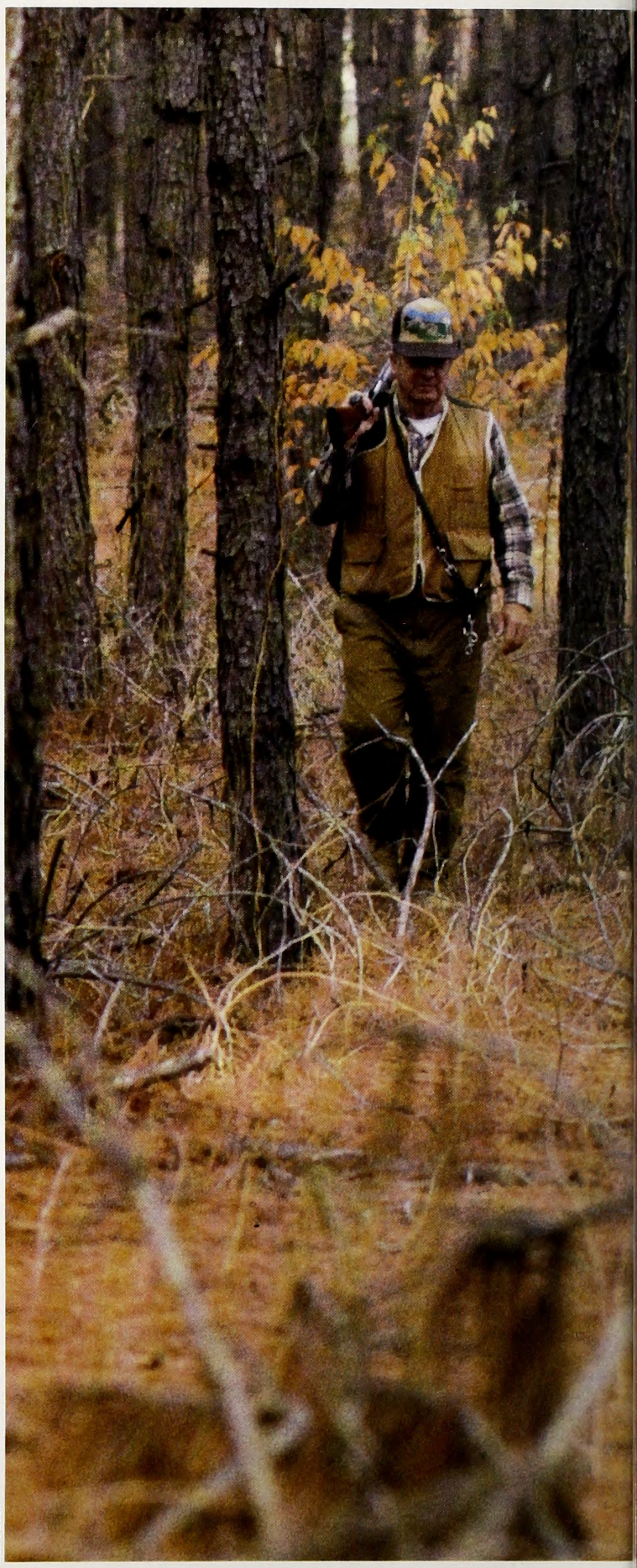
The information in this article is adapted from Tar Heel Wildlife On The Farm, *a brochure of practical habitat-improvement information prepared by biologist Terry Sharpe, small-game project leader, and published by the North Carolina Wildlife Resources Commission. The brochure is available free by writing* Tar Heel Wildlife On The Farm, *N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27611.*

The face of North Carolina is changing, and so are the traditional homes for many species of wildlife, particularly for such small game species as bobwhite quail and rabbits. One of the most effective ways to reverse the resulting long-term decline in populations of these species is by improving the wildlife habitat on individual private farms or lands.

There are many improvements private landowners can make to improve small-game habitat, and these changes will also improve the habitat for many other wild creatures. Some of the steps are relatively simple; others are more elaborate. For more in-depth information, you can obtain a free copy of *Tar Heel Wildlife On The Farm,* consult the references listed with this article, and contact the N.C. Wildlife Resources Commission's wildlife biologist for your district (names and addresses are available by calling toll free, 1-800-662-7137).

JACK DERMID

Since habitat improvements that help quail will generally also help rabbits, most of these recommendations are directed toward quail. Specific suggestions to help rabbit populations follow in a separate section.



KEN TAYLOR

BOBWHITE QUAIL

To improve quail populations, you must first assess the quality of food and cover on your land throughout all seasons of the year. The number of coveys your land can support depends on the variety of quality habitat available during critical periods — for example, in the nesting season, or the coldest weeks of late winter. If one particular type of habitat is lacking or in short supply, an excess of other types of quality habitat cannot overcome this shortcoming. There must be enough suitable food and cover for quail during all four seasons. Any gap will doom your chances of having an abundance of quail (or rabbits).

If you can first identify the biggest gap or greatest need, and concentrate your initial efforts in remedying this problem, you will see the quickest results.

Generally, quail prosper in areas with abundant young plant growth. Thus annual disturbance of existing vegetation or soil improves their food and cover requirements. A major portion of each covey's range must therefore be maintained in grasses and weeds because these plants provide seeds, insects and protection from predators. Well-dispersed thickets also provide some food, but more important, provide escape and loafing cover. Scattered trees add seeds, nuts and fruits which are important foods during some seasons.

If you are willing to make modest adjustments, many normal farming or forestry programs can be modified to increase quail populations. There are six major practices which are known to improve quail habitat by providing the needs of these game birds throughout all seasons.

TRANSITION ZONES

JACK DERMID

Quail are "edge" species, meaning they prosper in areas where two or more habitats meet such as borders between croplands and woodlands. Expanding the transition zones, or edges, of native weeds and grasses between cropland and woodland or hedgerows is the most economical and beneficial

Modern clean farming *techniques tend to leave fields barren of food and cover needed by bobwhite quail, and timber growing practices also remove cover or food in wooded bottomlands.*

LEONARD LEE RUE III

habitat improvement for most farms. These strips, or edges, provide cover, nesting sites and a diversity of food, and should be at least 15 feet wide. To maintain them at maximum quality, disk or burn the strips in late winter whenever the soil surface is more than 50 percent covered with dead vegetation (usually every two or three years). These zones should be rotated so that each field has at least two sides in nesting cover each summer.

STRIP DISKING

DEBORAH CONGER

In late winter just before new vegetation begins to appear, you can improve quail feeding areas by disking strips 20- to 40-feet wide through idle fields. The freshly turned soil produces a thick new growth of weeds and grasses that harbor better populations of insects and other quail food, and the young birds can quickly find cover in the adjacent undisturbed areas. Leave developing plum and blackberry thickets and sassafras clumps because these areas provide superb food and cover.

HEDGEROWS

JACK DERMID

Modern clean farming techniques have removed many hedgerows, yet hedgerows need not hinder agriculture crops. They serve as windbreaks and reduce soil erosion. More to the point, hedgerows can be the heart of a successful quail-management program. A 10-foot wide hedgerow with a 15- to 20-foot-wide transition zone is recommended, and it can be located to take advantage of existing breaks such as roadsides, drainage ditches and terraces.

Hedgerows will develop naturally with native plants and trees if strips are left; however, quicker results can be obtained by planting species favored by quail such as shrub lespedeza (available from the Wildlife Commission), blackberries, privet, autumn olive or plum. You can obtain information on sources of these materials from district wildlife biologists.

Maintenance of a hedgerow is fairly easy, consisting of periodically mowing or disking adjacent transition zones, and cutting any trees that threaten to shade out ground cover.

DEVELOPING FOODS

KEN TAYLOR

Many quail foods occur naturally, and you should learn to recognize them. These foods can easily be supplemented by simply leaving unharvested crops like soybeans in small patches or along the edges of fields near cover. The value of this practice is enhanced when you maintain a transition zone between the patches and escape cover.

Where native foods or farm crops are in short supply, it is helpful to plant foods that are used by quail in areas near transition zones, weed strips and hedgerows. Two types are available free to landowners from the Wildlife Commission.

Annual seed mixtures provide food for quail from early fall into the winter. These mixes consist of cowpeas, soybeans, millets, sorghums and buckwheat and they must be planted each year.

Perennial seed mixtures produce lasting food plots as well as good escape cover, and should be planted by mid-April and protected from disturbance for two growing seasons. Plots should then be mowed or disked lightly every other February. This mixture includes shrub lespedeza, annual lespedeza, partridge pea and varieties of other peas and beans.

Other excellent planting materials available from most farm supply stores include kobe lespedeza, Korean lespedeza, corn, milo, peas, wheat, rye and millet. Your county Agricultural Extension Office or district wildlife biologist can offer additional information on planting and culture methods.

FOREST MANAGEMENT

REX GARY SCHMIDT

Patchworks of both forest and farmland make ideal quail habitat, and can be improved even on farms where pine is being grown as a crop, although dense pine stands do limit quail populations.

By thinning timber stands to remove slow growing, diseased or crooked trees, breaks in the forest canopy can be left to permit light to penetrate and encourage growth of food and cover plants. Timber stands managed for maximum quail populations are more open than typical commercial forest stands. Ideally, 60 percent of the forest floor should receive direct sunlight in large patches (check this on a clear day at noon when trees are fully leafed).

Fire can be used very beneficially to improve quail habitat, and annual controlled or prescribed burns are recommended. Burning controls unwanted plants, keeps hardwood sprouts and young pines from shading out desirable grasses and weeds, stimulates food-producing plants and maintains an open, huntable timber stand. It even enhances pine timber growth. Hotter fires, obtained when the forest litter is dry and humidity is low, are needed to control large hardwood sprouts, but once these sprouts are under control, cooler fires should be used annually to help regenerate food and cover plants.

Large stands of timber should be subdivided by disked fire lanes before burning, and small areas up to one-half acre of thickets and nesting cover should be circled by fire lanes and protected from burning. Burns are best conducted by experienced persons during February and March, and the N.C. Forest Service should be notified in advance.

RABBITS

While most of the habitat improvements undertaken to help quail will also improve rabbit populations, there are several improvements that are particularly beneficial to rabbits. Rabbits, of course, are noted for their incredible reproductive potential, but they are also a favorite food of many predators including foxes, owls, bobcats, dogs and cats. This makes the availability of dense escape cover very important.

COVER

JACK DERMID

The most important place for dense escape cover is the edge where field and forest meet. Food is normally abundant here, but there must be sufficient cover to protect rabbits (and quail) from predators.

To create ideal rabbit cover at the edge of a field, it is recommended that you cut down everything 30 to 50 feet into the woods. Take what you need for firewood, but leave the tops and brush where they fall. Within a couple of years, a dense jungle of honeysuckle and briers should cover the fallen tops, although you will have to repeat the cutting process from time to time as young trees begin to shade the ground cover. To increase the density of natural cover in such areas or along field edges, fertilize these areas with a complete fertilizer (8-8-8 or 10-10-10) in early spring.

More On Quail And Rabbits

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KEN TAYLOR

***Rabbits, and also** quail, benefit from a variety of fairly simple and inexpensive methods of improving food and cover. Biologists believe landowners hold one of the essential keys to restoring small-game populations because so much of the state's small-game wildlife habitat lies on private lands.*

FOOD FOR RABBITS

DEBORAH CONGER

Mowing or strip disking 8- to 10-foot trails at 150-foot intervals through abandoned fields will provide the young plant growth needed to provide a good food supply for rabbits, and if the soil is moderately fertile, you need not worry about planting the strips. Strips should be mowed monthly during the summer to maintain continuous young growth.

To maintain your old field, mow about one-third of the area in addition to the strips in late spring or early summer so that the area is fully vegetated before frost. In most fields you can maintain the field by mowing only when young trees threaten to become too large to mow. Keep as much cover as possible to provide hiding and resting places.

HUNTING QUAIL AND RABBITS

When food and cover are abundant, biologists have traditionally maintained that quail and rabbit populations cannot be overhunted. But, in poor habitat, overhunting is a possibility you'll want to avoid.

Determining your quail population will be an estimate at best, but it may help to use a map to locate places where you find coveys of quail and estimate numbers each fall. To ensure adequate carry-over of breeding birds, harvest no more than half the fall population.

It will be more difficult to estimate your rabbit population, but while heavy hunting pressure early in the season is unlikely to harm spring breeding populations, it's recommended that you hunt the area less often in January and February unless you're certain you have a good population. A conservative approach is best. ⊠

Caves & Critters

It's dark down there, but spelunkers find plenty to see in North Carolina's 870 caves — including some uniquely adapted wildlife.

by Kay Scott

Hidden beneath the world we see everyday is another wilderness, one not so apparent to the casual observer. This wilderness holds the ingredients of myth and fables. It is the underground world of the cave.

I was a child when I had my first experience with caves. After a brief climb up a steep slope near my home, I stood in the cool mouth of a dark hole and imagined that dragons, snakes or bears waited inside. I never felt courageous enough to find out. Later, as an adult, I stood at another, similar entrance and remembered that magical time. And, I admit, there was just a moment's hesitation that hot summer day as I slipped through the opening into a world different from what I had imagined, but no less magical.

"Caving isn't a macho sport," states Susan Holler, an experienced caver from Old Fort. "It takes education, a nose for safety and a desire to learn. You've got to love it because you often end up wallowing or sliding through knee-deep mud and bat guano." (Guano is, for the record, the polite way to refer to bat excrement.)

For thousands of years caves in the area now known as North Carolina have been used by humans for a variety of purposes. One McDowell County cave served as a brothel, while an Ashe County cave was an

CATO AND SUSAN HOLLER

The cave was at least twenty feet long, but we couldn't really tell how big it was — it didn't matter. We were on the edge of a place, a being that was larger and deeper than we were.

There is always something hidden in this world, that you can't just realize from the outside. You need to make contact with it now and then, to nod your head in knowing, to receive its blessing.

— Gary Paul Nabhan
The Desert Smells Like Rain
1987, North Point Press

important link in the underground railroad during the Civil War. Some moonshiners hid their brew in caves. Caves also have served such purposes as shelters, areas for tool manufacture, temporary residences, and hideouts. In addition, during the 1800s, caves often provided important minerals such as saltpeter. (Saltpeter's nitrate made it an important component of gun powder.)

Caves are found throughout North Carolina, from the mountains to the sea. Most people are familiar only with the state's larger or more popular caves, such as Linville Caverns, Moonshiner's Cave (Chimney Rock Park), Boone's Cave (Boone's Cave State Park) and Tory's Den (Hanging Rock State Park). But according to Dr. Cato Holler Jr., Director of the North Carolina Cave Survey, this state is blessed with a much vaster underground wilderness than many realize. In fact, his survey currently lists 870 Tar Heel caves.

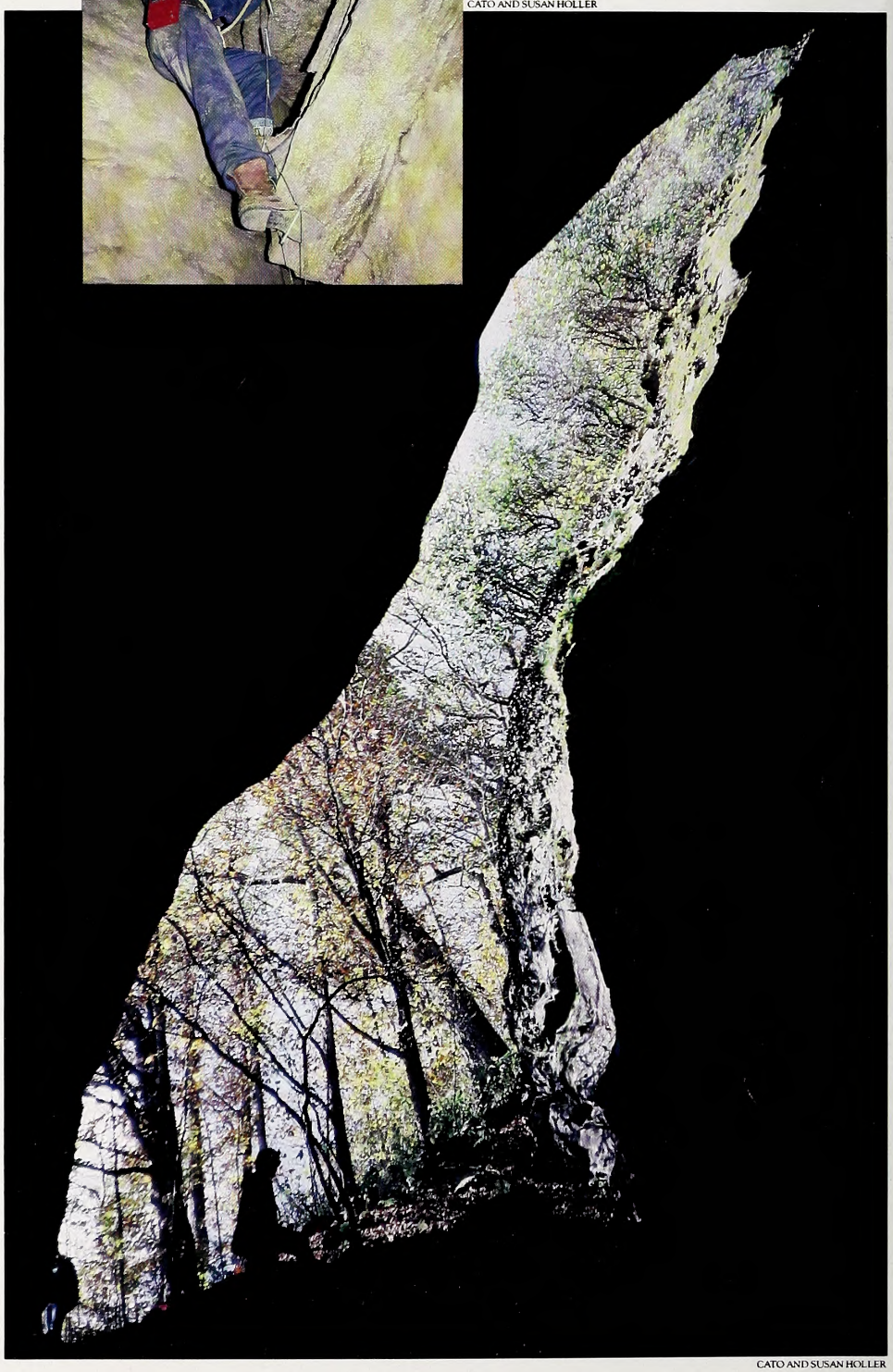
Finding, exploring and cataloging these caves has been an act of love and a way of life for the Holler family and for other volunteers associated with the group. The survey serves as a central source of information, not to satisfy the curiosity of the general public, but to provide aid to the serious caver, speleo-researcher and pertinent government and private agencies. In the past, the survey has assisted groups such as the Smithsonian Institute, the N.C. Museum of Natural Science, The Nature Conservancy, the U.S. Fish and Wildlife Service and the N.C. Department of Transportation.

North Carolina has three major cave types — solution, fissure and boulder. When most people think of a cave they usually think of solution caves. These are caverns commonly formed in limestone with formations such as stalactites and stalagmites. (Stalactites are conical calcite depositions formed from the top of the cavern down. Stalagmites are similar except that they form from the cave floor reaching upward.) Linville Caverns is a good example of this type of cave.

"North Carolina's limestone caves range from those in 'utero' to those in old age," declares Susan Holler. "A keen observer can travel to the coast and see the young limestone near Wilmington from which such caves are born. Traveling across the state to the mountain caves, one can see caverns in ancient limestone." Most of the famous caverns in our neighbor states of Virginia, Tennessee, Kentucky and West Virginia are limestone caves, whereas most of our caves are fissure or boulder caves found in granite and other hard rocks.

Fissure caves are our second kind of cave. The N.C. Nature Conservancy's Bat Cave, with a room the length of a football

CATO AND SUSAN HOLLER



CATO AND SUSAN HOLLER

***Bob Currie** (inset) cautiously descends into a fissure cave. With 870 identified caves in the state, spelunkers (cave explorers) have a lot of opportunities to practice their sport. Fissure caves (above), solution caves and boulder caves are the three main types of caves found in North Carolina.*

field, is one example of this type. Moonshiner's Cave at Chimney Rock Park is another example. Fissure caves are formed by the physical process of the earth's movement and may also be referred to as tectonic caves. Because such earth movement is a constant occurrence, particularly in the mountains of western North Carolina, these caves may be unstable. The Hollers tell the story of their repeat visit to a tectonic cave where they found a 63-ton piece of ceiling that had dropped into the main passageway since their last visit.

The third type of Tar Heel cave is the boulder or talus cave. These occur when rocks fall and form a pile. They are often characterized by their multiple openings and shorter passageways.

The cave environment, past the entrance way, is one of darkness, high humidity and relative constant temperature, about 52 degrees Fahrenheit. As you might guess, life in the cave environment offers a unique challenge to those creatures who call it home.

"The first question everyone asks us is, 'Aren't there a lot of snakes in caves?' " states Susan. "Well, normally, you don't find them there. Snakes aren't adapted for life in darkness or the colder temperatures found in caves. The second question is, 'Well, aren't there bears?' The answer to that one is no. Normally a hibernating bear will search for a place just a bit bigger than its body size. Most caves are just too large. Besides, solution and tectonic caves are too damp and drafty for a comfortable winter's sleep."

What one does find in this wilderness are unique animals well-adapted to the particular environment. Biologists divide these animals into three categories — troglophiles, trogloxenes and troglobites. Troglobites live their entire lives inside caves. They are the species of animals peculiar to the cave environment. Troglophiles also live their entire lives inside caves, but they differ from troglobites in that members of their species are also found living outside caves.

Trogloxenes are totally dependent on the outside environment. They are just visitors to caves, although they may be regular ones. They feed outside the cave and return to it either every day or every year. Perhaps the most well-known trogloxene is the cave-dwelling bat. These bats emerge en masse at dusk to feed and just before dawn they return to their cave home to sleep, hanging from the cave roof or walls throughout the day. In some species, great families of bats hibernate together in cave rooms called "hibernacula."

Bats are uniquely suited to their dark home, having developed a type of sonar to help them locate their insect prey in the dark. This adaptation also helps them navi-

JOHN MACGREGOR

JOHN MACGREGOR

***The crevice salamander** (top) is a common species in caves. The cave environment is perfect for hibernating bats such as the endangered Virginia big-eared bat (above). Bats' echolocation enables them to negotiate the dark and narrow passageways.*

gate the cave's dark passageways.

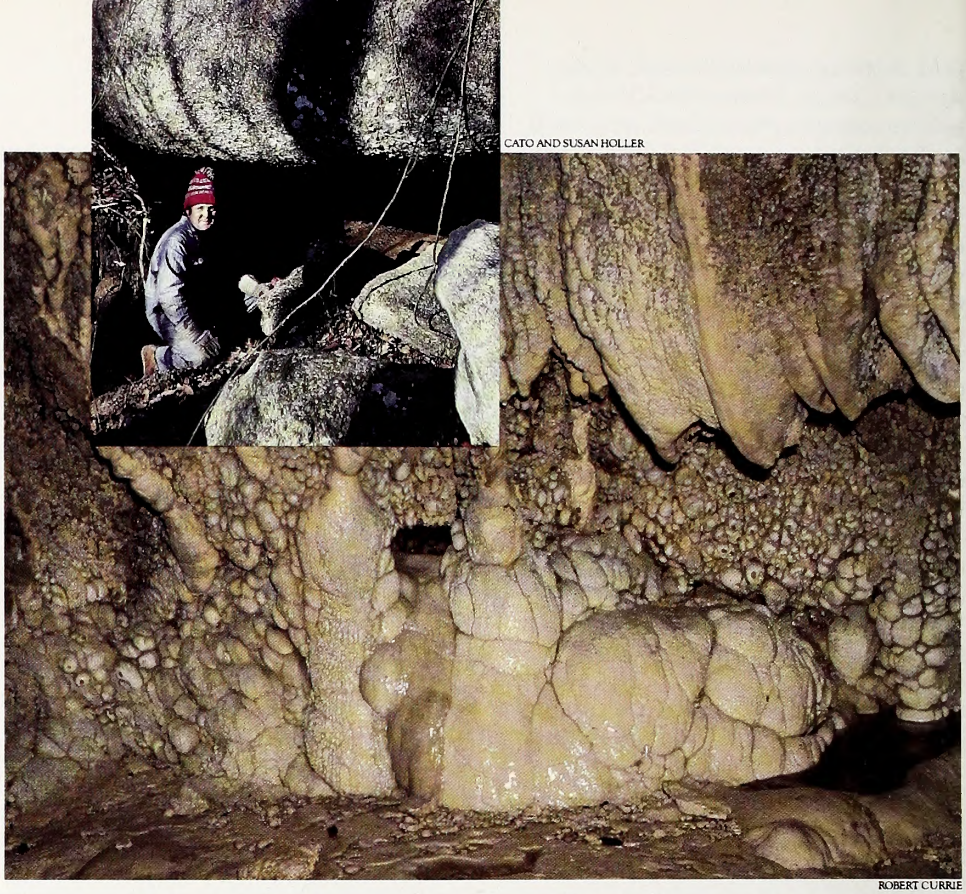
Though just visitors to the cave, trogloxenes are important parts of the cave ecosystem. That's because they are a source of additional food for the true cave dwellers. Since caves are almost entirely dark, the only plants that grow there are fungi and bacteria. Bats, cave crickets, cave rats and other trogloxenes add to the food chain when they drop food that they bring in from the outside. Their excrement is also part of the food chain and, sometimes, their dead bodies.

"The trogloxenes, such as bats, are adapted to life both in and out of the cave," states Cato Holler. "However, the animals who live full-time in the cave are a different matter. They are uniquely adapted to life in the darker, cooler cave environment. Most animals who live full time in the caves are characterized by blindness and the loss of skin pigmentation. Many of these cave dwellers slow down their metabolic rates because of lack of food, and in some areas they exhibit longer legs or antennae."

According to the publication, "Some Facts About Caves" (a publication of the Virginia Region of the National Speleological Society and the Cave Conservation Institute), the most important cave-dwelling animals are found in groups that include flatworms, snails, crayfishes, shrimps, millipedes, spiders, mites, pseudoscorpions, springtails, flies, beetles, and salamanders. As active cavers, the Hollers have helped locate a dozen entirely new species of animals in North Carolina caves. One species of flatworm, *Phagocata holeri*, was named in Cato's honor. He also located the first known North Carolina colony of the Virginia big-eared bat, one of two cave-dwelling bats in the state listed on the federal endangered species list. The other is the Indiana bat.

"The Indiana bat primarily ranges north and west of here," states Bob Currie, a biologist with the U.S. Fish and Wildlife Service. "We have records for five or six caves in North Carolina which this species uses for hibernation." The Indiana bat roosts in trees throughout the summer and uses caves only for winter hibernation. "The Virginia big-eared bat is also endangered," continues Currie. "There is only one small hibernating colony in this state." This bat uses caves year-round, in the summer for maternity roosts and in the winter for hibernation.

To attempt to preserve this endangered bat, the Flittermouse Grotto (a western North Carolina caving chapter of the National Speleological Society), and volunteers of the Cave Conservation Institute (a caving group based in Virginia) cooperated with the U.S. Fish and Wildlife Service and the N.C. Wildlife Resources Commission's Nongame and Endangered Wildlife Program to build a gate across the entrance to the cave with the endangered colony. This gate prevented human disturbance while giving the bats free access to their home.



CATO AND SUSAN HOLLER

ROBERT CURRIE

***Spelunker Al Clark** (inset) about to explore a boulder cave. The most common solution caves are made from limestone, featuring colorful deposits of calcium carbonate. Limestone caves are more common in neighboring states. This detail (above) is from Virginia's Rocky Hollow Cave.*

Two other bats are not actually listed on the federal list of endangered species. However, this may change as more information becomes available. These are the Eastern small-footed bat and the Southeastern big-eared bat. In addition, two subspecies of wood rats are both under review for addition to this list. These are the Southern Appalachian wood rat and the Eastern wood rat.

Despite all that is known of the cave environment and its animals, groups such as the North Carolina Cave Survey feel that they have only begun to scratch the surface, so to speak. This group is very interested in receiving leads to the location of more caves. "Some of our best leads have come from hunters, fishermen and other people who are frequently outdoors," states Cato. "We use these leads, along with geological maps, aerial surveys, topographic maps and the elusive sixth sense to begin our search."

The existence of such a survey is important. According to the Hollers, information in the N.C. Cave Survey helped stop the nuclear waste dump that was proposed for location at Sandy Mush.

"Since survey volunteers were able to take the press to a cave in that area," states Susan, "we could help local residents prove to the Department of Energy that the geological information on which they had based their decision was incorrect."

Individuals with leads about unexplored caves may write the N.C. Cave Survey at P.O. Box 100, Old Fort, N.C. 28762.

The reluctance of survey members to share information on specific cave locations is justified. In the past, North Carolina caves have been the subject of much vandalism. "Cave formations are very delicate," states Susan. "Stalactites and stalagmites form at the average rate of 1 cubic inch per century. One careless touch and irreparable damage is done." Hopefully, North Carolina has taken its first steps to assure that such vandalism will stop. During its 1987 session, the N.C. General Assembly passed "An Act to Protect Caves" (14-159.20-.23). This bill went into effect on October 1, 1987. In addition to protecting caves from vandals, the bill prohibits the sale of speleothems (those formations found in caves) and it limits the liability of owners who allow groups of recreational cavers to use their property.

The Hollers hope that this law will be followed by a similar state law to protect

plants and animals that live in caves. According to the Hollers, caves are also important environmental indicators. "We can see water-quality changes in caves more quickly because of the delicate ecological balance there. What happens on the surface affects the subsurface. It is all interconnected," states Susan. The Hollers stress the need for conservation of the state's underground wilderness. "We feel that commercial cave ventures, such as Linville Caverns, are an important tool for cave conservation," states Susan. "These facilities allow visitors to experience caves in a safe environment, providing a good, controlled introduction to this underground world."

Those who are seriously interested in caving should contact the National Speleological Society (Cave Ave., Huntsville, AL 35810) to get the names of grottos or local caving clubs located in their area. The Hollers stress that it is important to cave with an experienced group.

"Caving is a sport which cannot be learned from a book," states Cato. "There are a lot of rules and back-up systems which are necessary to insure safety. It just isn't safe to go caving with a flashlight. Grottos encourage safety rules such as never caving with fewer than three people; leaving word on the surface as to your location; always wearing head protection; never caving with less than three sources of light; and since the average annual temperature in caves is 52 degrees, being prepared for the danger of hypothermia."

As with any of the state's wilderness areas, remember, "If you pack it in, pack it out." Leaving food scraps behind can upset the delicate ecological balance of a cave and cause a population explosion that will be followed by a corresponding population crash. Similarly, it is not a good idea to remove naturally occurring organic matter that washes into caves since this material serves as a natural food source for animals in this environment.

Cato advises extreme caution about entering unknown caves. His caution is based on experience. "Once while we were exploring for caves, Bob Currie passed a boulder pile. When we met up again later, he told me about it and reported a strange smell coming from it. Well, as I went back by, I decided to just take a quick look and see if it led to a cave. It didn't. Instead, I found I had jumped into a den of timber rattlers. As you might imagine, I levitated right out of there!"

"We've caved around the world," states Cato. "Yet, we keep coming back to North Carolina, to the small, little known caves of this state."

"Caving offers something for everyone," continues Susan. "You can either approach the cave with a magnifying glass or from a broad perspective and you'll always find something interesting." ⊠

Visiting North Carolina's Caves

The best way to visit one of North Carolina's underground resources is through one of the state's commercial cave operations or by visiting a state park.

Linville Caverns. P.O. Box 567, Marion, N.C. 28752. (704) 756-4171.

Linville Caverns is located on U.S. 221 between Marion and Linville (McDowell County). Staff at the caverns offer guided tours through the limestone formations. Tours last approximately 30 minutes. (Large groups should call for reservations). Hours vary seasonally. They are open 9 a.m.-6 p.m. daily from April until the end of October. Beginning November 1, they are open 9 a.m.-4 p.m.

Call before you visit during the winter months since this schedule may change.

Admission is $3 for adults and $1.50 for children, ages 5-11. Younger children are admitted free.

Chimney Rock Park. P.O. Box 39, Chimney Rock, N.C. 28720. (704) 625-9611.

Moonshiner's Cave at Chimney Rock Park is a fissure cave. Visitors to this privately owned park are welcome to visit the cave and descend the stairs to the bottom to see a replica of a still.

Chimney Rock Park is located 23 miles southeast of Asheville on highways 64 and 74 (Rutherford County). The park is open from mid-March until November, weather permitting. Tickets are sold from 8:30 a.m.-4:30 p.m. Visitors to the park are welcome to remain until the 6 p.m. closing time.

A trail map and trail guide are available when you enter the park. For larger groups, with prior special arrangements, a naturalist is available to conduct tours. In addition to Moonshiner's Cave, Chimney Rock Park offers hiking, picnicking, a trip to the top of Chimney Rock and other activities.

Admission is $7 for adults and $4 for children. Children under 6 years of age are admitted free.

DIVISION OF PARKS AND RECREATION/TORY'S DEN

Tory's Den. Hanging Rock State Park, P.O. Box 186, Danbury, N.C. 27016. (919) 593-8480.

Tory's Den is located in the 6,000-acre Hanging Rock State Park (Stokes County). Legend has it that supporters of Great Britain used this cave as a hideout during the American Revolution. Access to the cave is by a hiking trail.

Hanging Rock State Park is open from 8 a.m.-6 p.m., November-February; 8 a.m.-7 p.m., March and October; 8 a.m.-8 p.m., April, May and September; and 8 a.m.-9 p.m., June until August. In addition to Tory's Den, the park offers hiking trails, swimming, boating, tent/trailer camping and picnicking.

Boone's Cave. Boone's Cave State Park, Rt. 2, Box 224-M, Troutman, N.C. 28166. (704) 528-6514.

Boone's Cave is located in Davidson County in the 110-acre Boone's Cave State Park. Some say that Daniel Boone made his residence here for a while and that he may have sought refuge in the small cave.

Boone's Cave Park is open 8 a.m.-8 p.m., June-August; 8 a.m.-7 p.m., April, May and September; 8 a.m.-6 p.m., October-March.

In addition to the small cave, the park offers hiking trails, canoeing, lakeside fishing, an interpretive exhibit and picnicking.

Resting And Feeding Sites Planned

Goose Management Stresses Habitat

Written and Edited by Mark Taylor

The Wildlife Resources Commission recently approved a program to improve waterfowl habitat across the state in an effort to curb a steady decline in Canada goose populations in North Carolina.

In the 1960s, the state boasted Canada goose populations of 232,000. By 1986, the number had dropped to 22,000 birds.

The new program, for which commissioners agreed to seek funding, is a continuation of the agency's Canada Goose Management Plan adopted in 1986. The plan's goals include the improvement of habitat to provide additional feeding and resting areas for wintering flocks from the North, and the establishment of resident flocks in some coastal areas.

Portions of that plan were carried out earlier this year when biologists in the Commission's Division of Wildlife Management transported about 1,000 Canada geese from northern states to six relocation sites in Hyde County. State Rep. Howard Chapin of Beaufort County steered through the North Carolina General Assembly a bill that provided $100,000 for the Canada goose restocking program.

The newest goose restoration program would begin in 1988. The additional funds the Commission currently is seeking would be derived from the new waterfowl hunting license that become mandatory this year. These funds would be used to develop 11 goose resting and feeding sites totaling 6,212 acres located from Currituck to Wilkes counties. The Commission would lease hunting rights on these sites to create refuges where no hunting would be permitted, and would also pay landowners to leave portions of wheat and corn crops. Counties scheduled for habitat development are Currituck, Hyde, Washington, Bertie, Randolph, Davidson, Wilkes and Davie.

N.C. DIVISION OF ARCHIVES AND HISTORY

Days Of Yore: *North Carolina traditionally boasted of some of the finest hunting for Canada geese on the East Coast, but a long-term decline in the number of birds wintering in North Carolina has prompted the Wildlife Commission to begin a program of improving goose habitat in the state in hopes of establishing a resident, wintering population.*

"If something catastrophic were to happen to our migratory goose flock, we could lose our population altogether," said Tom Monschein of New Bern, the Commission's waterfowl specialist. "We need to develop more roost areas and protect wintering birds."

Since 1983, the Commission has introduced a total of 4,356 geese on 115 release sites in eastern North Carolina.

"Several of these flocks have become established and are attracting and holding wintering birds," Monschein said. "But caution must be used in establishing additional resident flocks to ensure that these flocks will be compatible with existing uses of the areas."

In recent years, waterfowl biologists have banded Canada geese with neck collars to monitor movements and survival of geese in the Atlantic Flyway. The neck collar study is part of a project sponsored by the Atlantic Flyway Council to better manage populations in the flyway by finding ways to increase populations that winter in the South.

This year, the Wildlife Commission joined several other states in offering more protection to inland geese by closing the hunting season on them west of Interstate 95.

The closed season, the banding program and the enhancement of habitat are all measures the Commission is taking to boost the goose population in North Carolina. The new program would become effective in 1988.

— Angela Hill

And That Ain't All

This Deer Has Real White Tail

JOYCE WALKER

Sign Of The Season: *Heavy snows provide an outlet for an 11-year old's creative imagination. This snow deer graced one Alleghany County lawn for several days last winter. The species of deer — a whitetail, of course.*

Supported By Nongame Checkoff

New Grants Program Helps Nongame Wildlife

Researchers conducting studies of nongame and endangered wildlife will be getting some help. A program to provide $50,000 in small grants to fund nongame and endangered wildlife projects has been approved by the N.C. Wildlife Resources Commission.

The grants, ranging from $500 to $5,000, will be available to researchers, conservation organizations, and other government agencies. Funding for the grants program, and most other nongame projects, is obtained largely through the checkoff for the Nongame and Endangered Wildlife Fund on state income tax returns.

"We're very excited about the wide range of projects this grant program could support," said Debbie Paul, manager of the Commission's Nongame and Endangered Wildlife Program. "The program will be similar to the state Stream Watch Program which provides small grants to organizations or researchers for individual projects dealing with water quality. Our focus will be the same except the projects must benefit nongame wildlife species in North Carolina. For example, a local Audubon Club or Boy Scout troop could apply for a grant to build a wildlife observation blind, or researchers at colleges or universities could obtain grants to study specific nongame species, such as shorebirds."

All grant proposals will be reviewed by the Wildlife Commission's Nongame Advisory Committee, which is composed of representatives of conservation organizations and the state's scientific community. This committee will decide which projects should be funded, and at what level.

All grants will be made for a single year. Although multi-year projects may be proposed, funding beyond the first year will depend on the progress of the project, availability of funds, and how well the project meets the advisory committee's goals.

"Many nongame species have never really been funded in North Carolina, and this program could be a real help in providing additional scientific information," said Dr. James Parnell, chairman of the Wildlife Commission's Nongame Advisory Committee. "It could also support a variety of education and management projects that will enable more people to observe and enjoy nongame wildlife. We're looking forward to working with conservation groups, school or 4-H groups, graduate students and researchers, and other government agencies in the development of this program, and invite them to submit grant proposals."

Information on the nongame grants program is available from the Nongame and Endangered Wildlife Program, N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27611.

Field Notes

Season openings, closings, and regulation changes:

- Pheasant season closes Feb. 1.
- Rabbit season closes Feb. 29.
- Quail season closes Feb. 29.
- Grouse season closes Feb. 29.
- Eastern raccoon season closes Feb. 29.
- Common snipe season closes Feb. 27.

Public Hearings Slated

Proposed changes in hunting, fishing, and trapping regulations for the 1988-89 seasons will be presented at a series of public hearings in each of the state's nine wildlife districts. The Wildlife Commission values public comment and urges all interested citizens to attend. Each hearing begins at 7 p.m. The schedule is as follows:

- New Bern — Courthouse, Monday, Feb. 8.
- Edenton — Old Courthouse, Tuesday, Feb. 9.
- Nashville — Courthouse, Wednesday, Feb. 10.
- Elizabethtown — Courthouse, Thursday, Feb. 11.
- Graham — Courthouse, Friday, Feb. 12.
- Albemarle — North Stanly High School, Monday, Feb. 15.
- Asheville — Courthouse, Tuesday, Feb. 16.
- Morganton — Morganton Civic Center Auditorium, Wednesday, Feb. 17.
- Elkin — High School, Thursday, Feb. 18.

Calendar Of Events

February 3-5
Southern Farm Show at the North Carolina State Fairgrounds in Raleigh.

February 13-14
Carolina Gun Collector's Association at the Charlotte Merchandise Mart in Charlotte. Largest gun show in the South, proceeds support youth shooting and conservation programs.

February 20
North Carolina Bowhunter's Association annual convention at Northwest High School near the Regional Airport in Greensboro. Seminars on bowhunting, equipment displays, and awards banquet. For more information contact Dayne Welborn, 5202 Northwest School Road, Greensboro, N.C. 27409.

February 27-28
Showcase of Woodcarvings Show at the Grady Cole Center in Charlotte. Sponsored by the Charlotte Parks and Recreation Department and the Charlotte Woodcarvers Club.

Dixie Deer Classic Slated

The heart of the winter brings sadness to the hearts of many Tar Heel hunters because it marks the end of some hunting seasons. But, one bright spot is the Dixie Deer Classic.

This year's Dixie Deer Classic, sponsored by the Wake County Wildlife Club, will be held from March 4-6 at the North Carolina State Fairgrounds in Raleigh. In addition to the usual displays of trophy deer heads and hunting equipment, an expanded slate of seminars will feature such topics as effective use of camouflage and tactics for trophy bowhunting.

Cooperative Project With New Hope Audubon

Lake Jordan Observation Blind Aids Eagle Watchers

The waters of Jordan Lake — routinely draw thousands of boaters and fishermen on busy summer weekends. But, – for the past few years, the lake has drawn droves of bird-watchers as well — attracted by the 60 or more endangered bald eagles which have been using the lake as a summer roost.

It's easier than ever now to watch the eagles thanks to an observation blind that was recently built by the New Hope Audubon Club of Chapel Hill in cooperation with the Wildlife Commission's Nongame and Endangered Wildlife Program. The blind is located on the northern end of Jordan Lake off N.C. 751.

"The construction of the observation blind was certainly one of the highlights of the nongame program last year," said Debbie Paul, supervisor of the Nongame Program. "The New Hope Audubon Society provided the materials and built the blind, and the Wildlife Commission obtained all the necessary permits and agreements with other agencies, built the parking lot, and implemented a management plan for attracting wildlife along the nature trail. We hope to get involved in similar cooperative projects with other conservation groups through our newly enacted small grants program for nongame wildlife projects."

A number of other ongoing projects were also continued last year. Seventeen peregrine falcon chicks were released in the mountains, and a pair of the birds released several years ago returned to nest — the first nesting of peregrine falcons to occur in the state in 30 years. Although the chick died, a "foster" chick was placed in the nest and was successfully reared. The first nesting attempt of wild peregrine falcons often fails, and biologists believe that the birds will probably return to nest next year.

On the coast, 10 bald eagles were released from hacking towers at the Lake Mattamuskeet National Wildlife Refuge. Biologists believe that it may be several more years before birds released through this project return to nest. The monitoring and protection of threatened loggerhead sea turtles continued, and 450 sea turtle nests were located and protected.

Several new projects also produced results. Populations of the endangered Tar River spiny mussel were found in the Tar River watershed. Also, the preliminary surveys of the northern flying squirrel and Virginia big-eared bat studies were completed in the mountains.

"We found that northern flying squirrels occupy much of the suitable habitat surveyed, which is the high-elevation spruce-fir forests, in the state," said Paul. "However, this limited habitat has probably been shrinking due to natural conditions since the last ice age. It now faces threats because of development and degradation by airborne pollution commonly called acid rain. We plan to take a closer look at the actual populations of northern flying squirrels this summer, and also see how they're being affected by competition from the more common southern flying squirrel. This information will help us develop management recommendations."

These, and many other nongame projects, are supported by the checkoff for the Nongame and Endangered Wildlife Fund on state income tax returns. Please give freely when you fill out your tax return this year — nongame wildlife needs your help.

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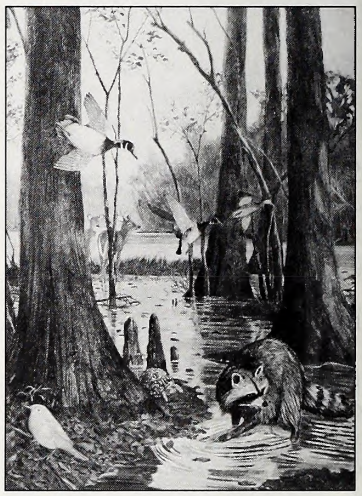


Too Good To Miss: *Colorful prints of bottomland hardwoods, signed by North Carolina Governor James Martin, are now being sold for $25 each. Proceeds from the sale of the prints will be placed in the Nongame and Endangered Wildlife Fund which supports a variety of nongame wildlife projects and the purchase of wildlife habitat in North Carolina. Only 500 copies of the poster-sized print are being issued, each signed personally by the Governor. These prints are now available on a first-come, first served basis by sending $25 (please make the check payable to the Nongame and Endangered Wildlife Fund, no credit card purchases accepted) to Nongame Print, N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27611.*

Carolina Gun Show Supports Conservation

N.C. GUN COLLECTORS' ASSOCIATION

Standing Room Only: *The Carolina Gun Collector's Association annual show is the largest of its kind in the Southeast, and all proceeds from the event support youth shooting and wildlife conservation programs.*

Over the past 15 years the club has donated over $100,000 to purchase firearms for Wildlife Commission and Boy Scout hunter-safety programs. The club has also established a target-shooting scholarship at N.C. State University, purchased equipment for the Carolina Raptor Center, donated gunsmithing equipment to Montgomery Technical Institute, and supported many other projects. This year's show will be held Feb. 13-14 at the Charlotte Merchandise Mart.

Pair Nest In Pender County

Fake Nest Is Osprey's Haven

Ospreys love to nest in the tops of tall, dead trees, on the tops of power poles, and even adjacent to the flashing lights on markers in the Intracoastal Waterway. Their nests are often seen atop television antennas near waterways, and they even take over large roadside signs in some areas.

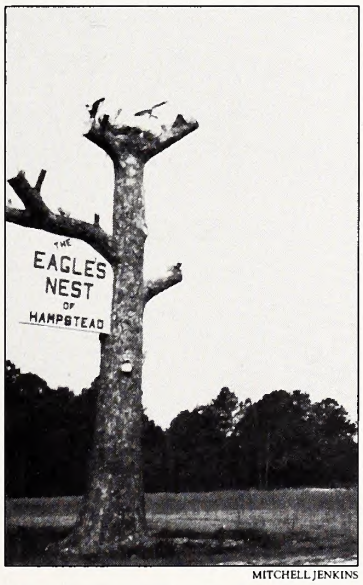
A pair of Pender County ospreys, however, decided to take as a nesting site a large artificial tree near Hampstead. The tree was built last summer to mark the future site of a shopping center. It featured a large sign proclaiming it to be "The Eagle's Nest of Hampstead." Above the sign is a large fake eagle with wings spread, and at the very top of the tree is an imitation nest.

These ospreys evidently couldn't read, however, because they ignored the sign and began installing a real nest on top of the artificial one.

They worked on the nest for four or five weeks, and one bird frequently flew in with large pieces of building materials such as marsh grass and small tree branches. The branches had apparently been trimmed off a large tree by someone and left, and the birds picked them up.

Unfortunately, the birds got a late start and didn't raise any young. It will be interesting to see if the happy pair returns this spring, though, and takes another try at raising a family. It will be a difficult task since the tree is located right on a main highway where there is heavy traffic and a lot of noise. However, this didn't pose a problem last year when they adapted quite well to their odd situation.

— *Mitchell Jenkins*
Hampstead



MITCHELL JENKINS

An Unusual Home: *This artificial tree, made of concrete and stucco, was erected to mark a shopping center in Pender County. The eagle's nest even sported an artificial eagle on the top branch at the left. A pair of ospreys, however, soon found the tree to their liking, and built a real nest on top of the artificial one.*

The Wildlife Endowment Fund Report

The Wildlife Endowment Fund is supported by the sale of lifetime licenses, lifetime subscriptions to *Wildlife in North Carolina*, and tax-deductible contributions. Only the annual interest from this fund is used for wildlife conservation, and the fund will play a key role in supporting wildlife programs in the future. Interest is earned through investments made by the State Treasurer's Office. For more information, write to the Wildlife Endowment Fund, N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27611.

Status on November 30, 1987

	Numbers Sold	Revenue Received
Lifetime Sportsman's License	43,925	$13,662,363.83
Lifetime Hunting License	286	63,147.70
Lifetime Fishing License	3,286	578,979.83
Lifetime Subscriptions to Wildlife in N.C.	1,223	153,610.31
Contributions	—	95,076.48
Fund Total		$14,553,178.15
Total Interest Earned	$2,320,838.73	

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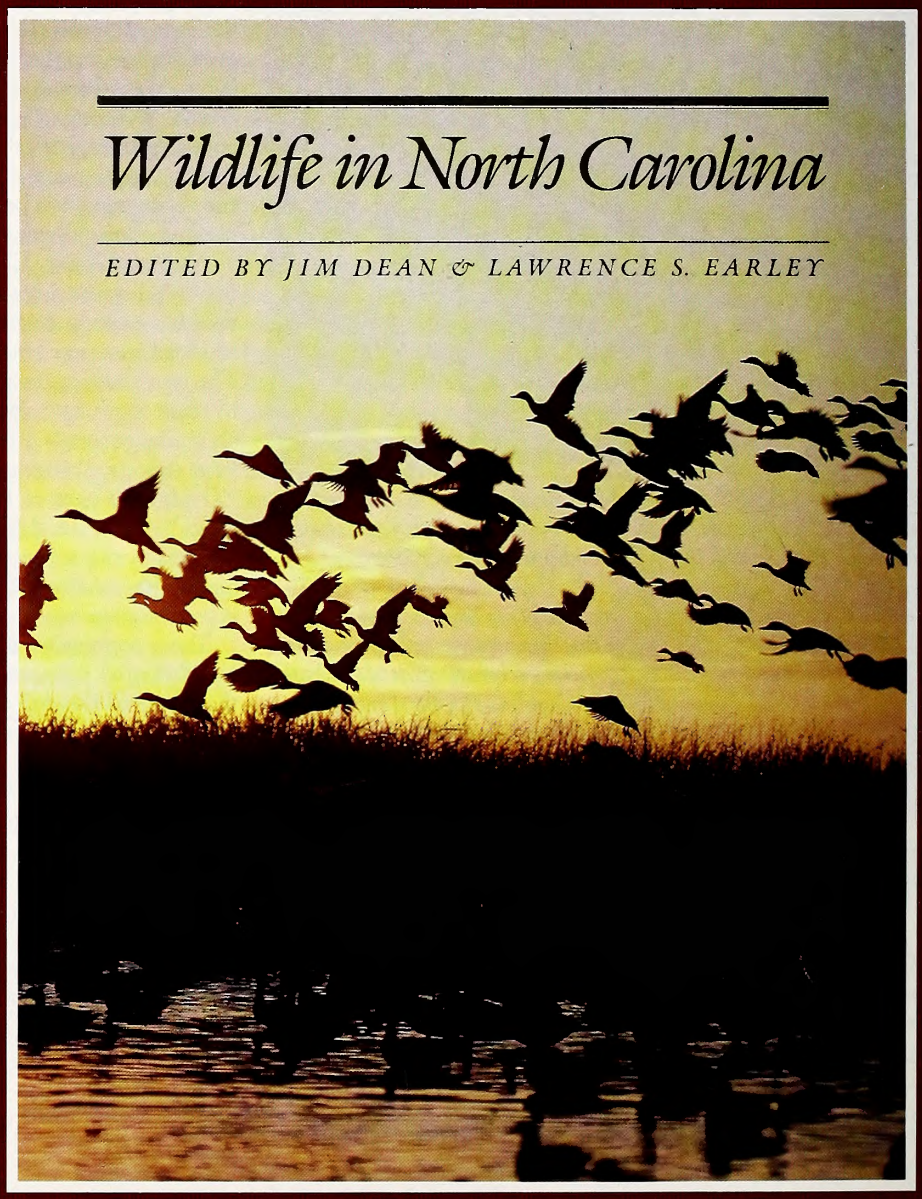

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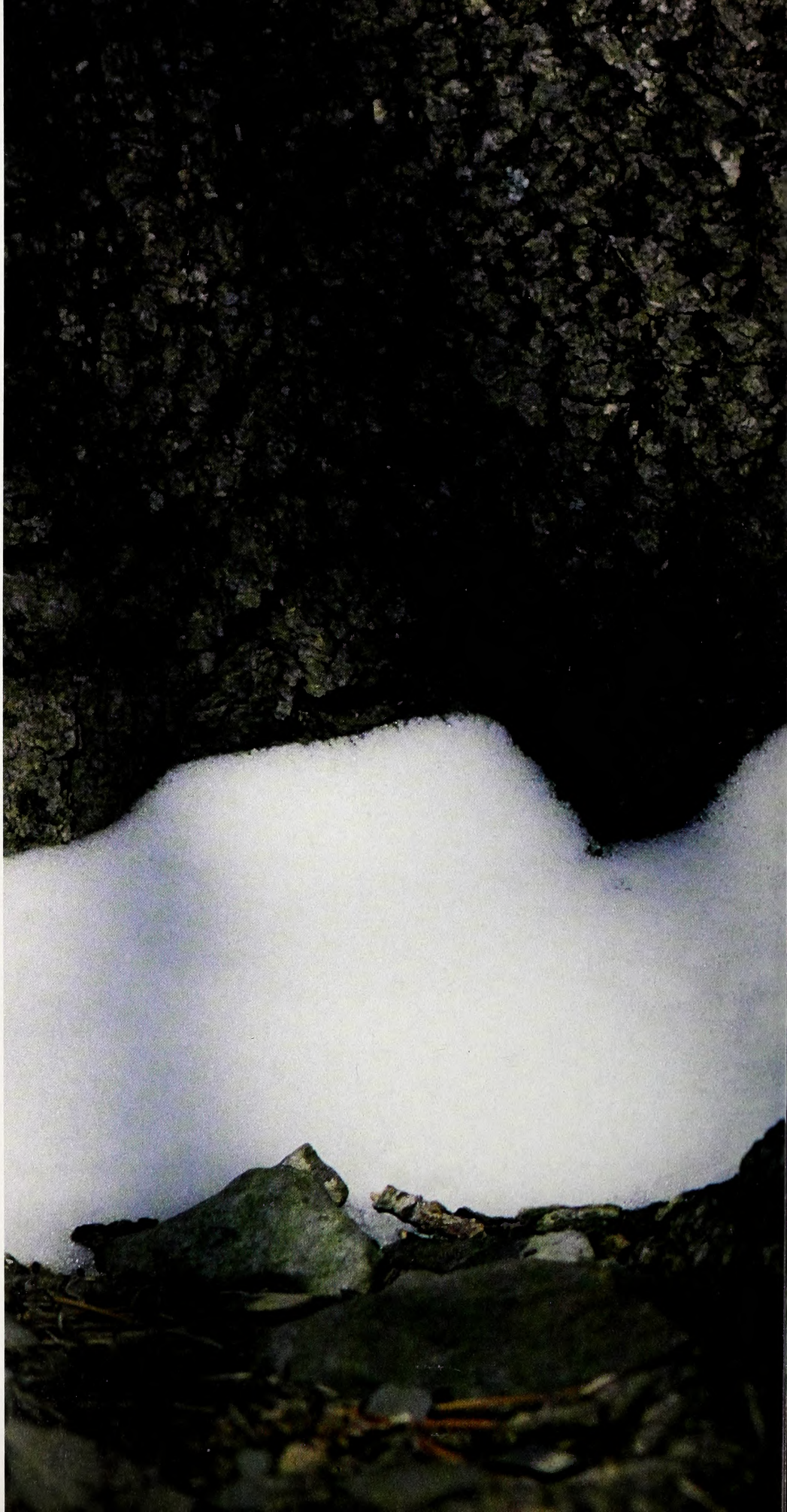

Shadow Seeker?

Although groundhogs hibernate in winter, males sometimes come out to seek a mate. Or perhaps, as tradition says, this one is really only looking for its shadow.

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Long Live The Varlets

by Jim Dean

Millard Reese of Kinston writes to quibble with a cover caption on the November, 1987 issue proclaiming the ruffed grouse "King" of the gamebirds.

"Whoever holds that misguided opinion surely never had any experience with the wild turkey," advises Millard. "The grouse is a fine little bird, without question, and there is no reason he shouldn't bear the title 'Prince' of the gamebirds. The undisputed 'King,' however, is the wild turkey gobbler."

LEONARD LEE RUE III

Having given this some consideration, I have concluded that Millard makes a valid point. Far too many game species have been carelessly titled by sportsmen (not to mention editors) who have little understanding of royalty. Indeed, when we did have an understanding of it, we called it off as a bad idea back in 1776. Curiously, hunters and fishermen persist in proclaiming potentates, and cleave to their choices with fierce loyalty.

Nearly a dozen critters are pretenders to the crown. Joining the ruffed grouse are such disparate species as the Atlantic salmon, tarpon, bobwhite quail, Canada goose, muskellunge, bighorn sheep, largemouth bass, bonefish, and of course, the wild turkey. Even this list does not include minority support for many other species. It may not be a regal dilemma, but it's a royal pitfall for those of us who occasionally seek a catchy phrase for publication.

If the ruffed grouse's sovereignty is so tenuous as to render it unfit to be king, why acknowledge a possible ascent to the throne by dubbing it prince? Right, Millard? What we have here is the perfect earl of gamebirds. Let us so stipulate.

As for wild turkey, I could certainly serve such a monarchy as long as it is robed in giblet gravy, although I'll admit the only gobblers of my acquaintance have been those seated at the round table. At least the turkey is big enough to defend the title unless, of course, we start hunting the noble ostrich.

While we're on the subject of feathered monarchs, we might as well dub the bobwhite lord of gamebirds. Ducks and doves can be counts, except the black duck which deserves at least a dukedom. The timberdoodle might rightly be a knight. Clapper rails and snipe are no better than varlets, while the crow must surely be the court jester.

Considering the Atlantic salmon, the gamefish most often accorded sovereignty, who could plight their sacred honor to a species most frequently encountered in a tin can the size of a hockey puck?

These deliberations raise a more serious dilemma, one not vouchsafed in Millard's recent letter. Species like grouse and salmon will always command a sizable aristocracy. But who unfurls the flag for punkinseeds or, for that matter, bluegills? Who pickets for possums, or carries the colors for carp? For every species that may rightly vie for a kingdom, there are dozens that lack the glamour and snob appeal to ascend any throne.

Consider, for example, the chain pickerel. A varlet sure enough, the lowly jack is the Rodney Dangerfield of fish. "I'd rather not go fishing than catch a jack," I've been told by numerous anglers. Good Heavens, what a shocking admission.

Even so, I know at least two anglers — Jim Simons and Jack Avent — who agree with me that the chain pickerel is one of the state's premier gamefish. At the risk of being shot for treason, we would even go so far as to admit that we'd rather catch a 5-pound pickerel than a largemouth bass of equal size, and not simply because big pickerel are far less common.

No freshwater fish native to this state attacks a lure more violently than a pickerel — except the muskellunge, and it's a first cousin. And if you believe all that foolishness about pickerel being poor fighters once hooked, your experience with *Esox niger* must surely be limited. As for eating quality, well I'll reluctantly admit that I'd rather eat a pin cushion. But, consider that this opinion is being rendered by a person who prefers fishsticks to flounder.

The best thing about pickerel is that they like cold water, and March is a good month to catch them. Furthermore, the pickerel is most at home in picturesque, yet relatively sterile, blackwater rivers and millponds. You couldn't find a more handsome spot to throw off the bonds of winter.

As Caesar said of Cassius, the pickerel has that "lean and hungry look," and it's a look you can learn to love. I can also attest to the pickerel's appetite for Rebels, spinnerbaits and crankbaits. There are pickerel holding my lures hostage in half a dozen secret spots in eastern North Carolina.

Now what I want to ask Millard is this. Does that qualify pickerel as the Ayatollah of gamefish?

March, 1988
Volume 52, Number 3

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WILDLIFE IN NORTH CAROLINA

Wildlife in North Carolina is the official educational publication of the North Carolina Wildlife Resources Commission, and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources and the environment we share with them.

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Cover *Trout lilies blooming at the base of a beech tree are among the first wild flowers to appear each spring. Photograph by Harry Ellis.*

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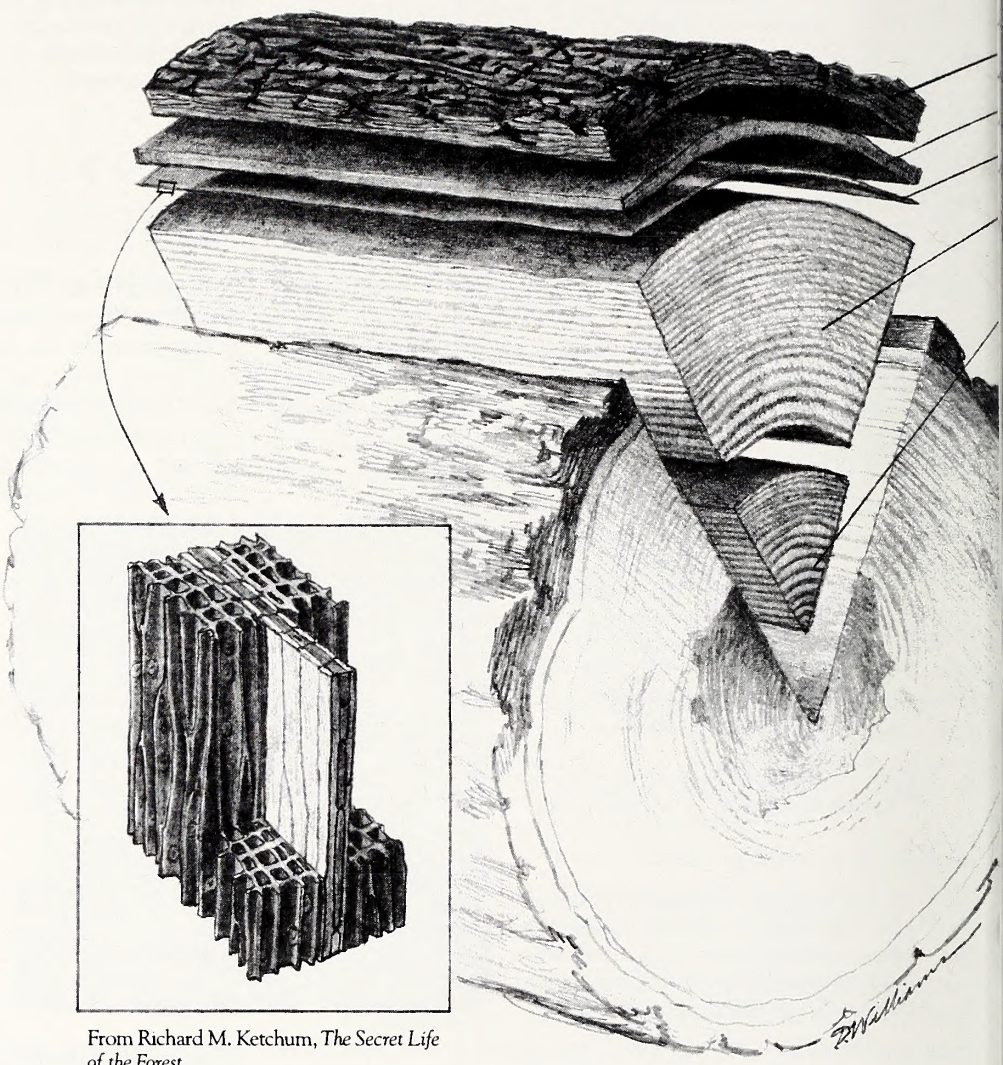
Just beneath the *bark of every tree there is a thin wall of cells called the* ***cambium****. These cells continually divide during the growing season, producing tubelike tissues that conduct sap. Tissues on the outside of the cambium, called* ***phloem*** *(or bast), conduct food from the leaves to the roots. The inside tissues, called* ***xylem****, bring sap from the roots to the leaves. This area of growth is called* ***sapwood****. When sapwood is blocked in time and can no longer conduct sap, it is transformed into a darker, stronger area at the core of the tree called* ***heartwood****.*

This cell production makes tree trunks grow wider each year and produces ***annual rings****. Springwood, the lighter area on an annual ring, is where the conducting cells are widest. The darker summerwood is where the cells are most narrow.*

During the growing *season, the layer of cells known as the cambium (light gray in the illustration) throws off new cells to the outside to form phloem. In time these cells will become part of the outer bark. The cambium also throws off new cells to the inside to form sapwood.*



From Richard M. Ketchum, *The Secret Life of the Forest*.

The Youthfulness Of Trees

written by Lawrence S. Earley / illustrated by David Williams

All that glitters is not gold. You can't tell a book by its cover. Still waters run deep. Beauty is only skin deep, ugly is to the bone.

Reach into the grab-bag of English maxims and you can find a half dozen or more ways of saying the same thing: Things aren't always what they seem to be.

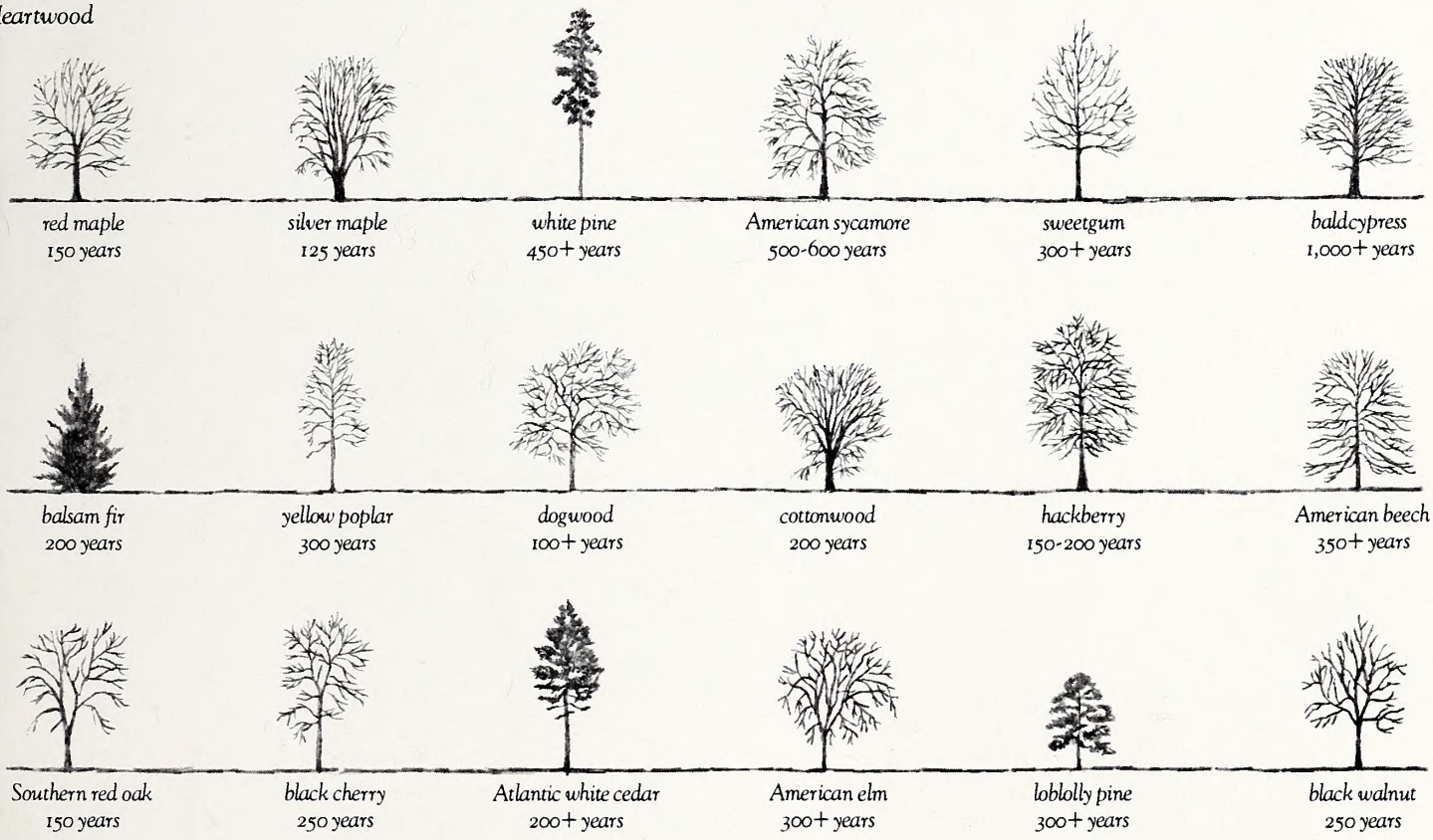
Take the matter of trees, the oldest of living things, the Methuselahs of the natural world, right? Well, sure. The first Methuselah, the Bible's record-holder for longevity at 969 years old, was a stripling youth compared to California's bristlecone pine. Gaunt and twisted by the fierce winds of its mountain habitat, this conifer reaches ages of nearly 5,000 years. North Carolina also is no slouch when it comes to harboring trees of great longevity. The maximum age of hemlocks, which grow here, is nearly 1,000 years. And along the Black River in Pender County, 1,600-year-old baldcypress trees — some of the oldest trees in the world — have been found.

Of course, most trees seem to take the middle course, maturing in 100 years or so and possessing a maximum age of about 200 years (see accompanying illustration). But even a short-lived tree like the black willow, which rarely reaches its 80th birthday, may still be decades older than almost all wildlife species and plants.

Not that every tree reaches its maximum age. Even if it escapes the voracious chain saws of modern man, it's still likely to fall to one of a variety of other ills. Lightning, for instance, or a forest fire or a great cold or drought. Lethal disease organisms will swarm into a wound. The tree succumbs to heart rot. It still stands, but it's dead. A wind

Outer bark
Phloem
Cambium
Sapwood
Heartwood

***Trees are the** world's oldest living things, capable of living to great ages. The ages beneath each species below are considered the tree's maximum age, although few trees ever reach these extreme ages.*



storm finally topples the weakened tree. It could be 25 years old or 250.

Thus longevity is somewhat a matter of luck. Growing in a favorable environment is a key but a harsh environment, like the habitat of the bristlecone pine, can also grow old trees as long as it's equally harsh on pests. Such conditions may spell the difference between a beech tree growing until it's 350 years old or dropping its branches as a 20-year-old sapling.

So what could be less superficial than the observation that trees are the oldest of all living things. But hold on.

How do we know a tree's age, anyway? Most children know that you can tell how old a tree is by counting its annual rings (see illustration). These rings are formed in spring and summer each year when the tree adds new cells to its outer circumference. Cell production, or growth, begins in the spring when the tree begins to pump water upward from the soil, and it continues through the summer. In many trees these spring cells are much wider than the summer cells, the better to accommodate the water and nutrients the tree needs to grow. But as the summer wears on the cells grow narrower and become darker in color until finally in fall the tree shuts down its waterworks entirely and goes dormant until spring.

The contrast between these lighter-colored spring cells and the darker summer cells shows up as a visible ring, and it happens every year. This is why a tree continues to add girth long after it has ceased to add height. Thus, you can estimate a tree's age, at least roughly, by counting its rings.

Yet here's where things aren't exactly the way they seem. Despite a tree's age, its growing parts are really quite youthful. Whether a tree is 10 years old or 1,000, those spring and summer cells are never much older than a year or two. The massive interior of the tree consists of billions of dead cells that have ceased to function except as support.

So here's the kicker: Trees are really more dead than alive.

SPINNERBAITS *for* BASS

There's nothing really new about spinnerbaits, but there are still a lot of bass fishermen who haven't added these superb lures to their arsenal.

by Jim Simons/photography by Jim Dean

As artificial bass lures go, spinnerbaits are old, dating back at least to the Shannon twin spinner popular in the 1930s. More modern spinnerbait designs have been popular for about 15 years, and many bass anglers use them. Maybe it would be more accurate to say they "confuse" them, because the best tactics for these productive lures have been argued hotly and heavily for a long time.

Scores of articles have been published telling how to fish the rows and rows of spinnerbaits available in any well-stocked tackle store, and there are even tackle boxes and fishing rods designed especially for these lures. Perhaps no other lure — except the plastic worm — has enjoyed greater popularity than the familiar safety pin configuration of wire, spinner blades, leadhead jig and single hook that constitute the standard spinnerbait.

Why, then, have so many anglers failed to catch fish with them? What tactics work best to maximize the tremendous bass-catching potential of these amazing lures? By using some of the following guidelines, perhaps you'll begin to see what all the shouting has been about.

The first thing to keep in mind is that spinnerbaits work better in certain conditions than others. This tidbit was forever imprinted on my brain in 1973 when modern spinnerbaits were just beginning to get a lot of publicity. Like any other self respecting basser, I went right out and bought a couple.

After a few futile casts in the pond behind my apartment, I consigned these big, gaudy lures to the bottom of my tackle box, thinking that I had been "had" again. Those spinnerbaits did not see the light of day again until some months later when I was fishing with my cousin in a cypress-studded millpond in the Coastal Plain. After an hour or so of casting shallow-running plugs which usually worked well, I tied on one of the

***Largemouth bass are** attracted to the flash of a spinnerbait's blade, especially in murky water. This lure has a blade that can be adjusted to make it wider or more narrow.*

***Several basic types** of spinnerbaits are available. Shown clockwise from the top left are twin blade, single blade and willowleaf spinnerbaits. The single blade lure is probably the most versatile of these effective lures.*

SPINNERBAITS for BASS

spinnerbaits just for the heck of it. As I retrieved the black-and-chartreuse-skirted spinnerbait over the partially submerged limbs of a fallen tree, a feisty 2-pound bass clobbered the bait. With renewed confidence, I continued to fish — and catch bass. Also impressive was the fact that I outfished my more experienced cousin by casting the nearly snag-free spinnerbait into places his treble-hooked lure would surely snag. And to my surprise, and his, I also caught bass in more open areas fishing behind him.

Looking back on that day, it is easy to see why the bass had shunned these spinnerbaits in the clear water of the pond behind my apartment, yet attacked them in the tea-colored, snag-filled millpond. The basic design of the single blade and the double-blade tandem spinnerbaits provide flash and vibration which attract fish in stained or even murky water when they might spook fish in clearer water. Also, the bent wire protects the single upturned hook, allowing you to fish in heavy vegetation and snag-filled areas with fewer hangups. This combination of heavy cover and stained water is most often found in shallow depths, and that's where spinnerbaits have earned their reputation for catching heavy stringers.

Of course, spinnerbaits have been used very successfully to fish deep or crystal clear water, but it is still the shallow, stained water areas of lakes and rivers where spinnerbaits really "shine."

Although spinnerbaits have been touted as a springtime favorite or a cold water lure, I've caught plenty of bass on them in summer around cover or in murky water. Wherever you encounter heavy cover and stained water, spinnerbaits will catch fish.

The single blade and tandem blade spinners are basically interchangeable, although each has certain advantages. Both combine flash, vibration, and snagproof qualities which make these lures so productive. With either, the steady retrieve is the easiest technique to use, and the key is using the right speed of retrieve. Bass are cold blooded, and this dictates a slow retrieve when the water temperature is below about 55 degrees Fahrenheit. A slow, steady retrieve along the bottom, however, is often productive in any water temperature. In warmer water, it pays to experiment because the bass will usually show a preference that day.

A fast retrieve, pulling the spinnerbait just under the surface causing a wake, can trigger some awesome strikes. This technique is sometimes called "buzzing" or "bulging" and seems to infuriate bass at times. It also covers a lot of water in a short time. The tandem spin or a large bladed single spin may be the best choice for this high speed bassin'. I've had my best results when the blade doesn't actually break the surface, but they also work well at times when the blades splatter along the top. Some great new baits like Lunker Lures are designed to run on top, and they are close kin to spinnerbaits.

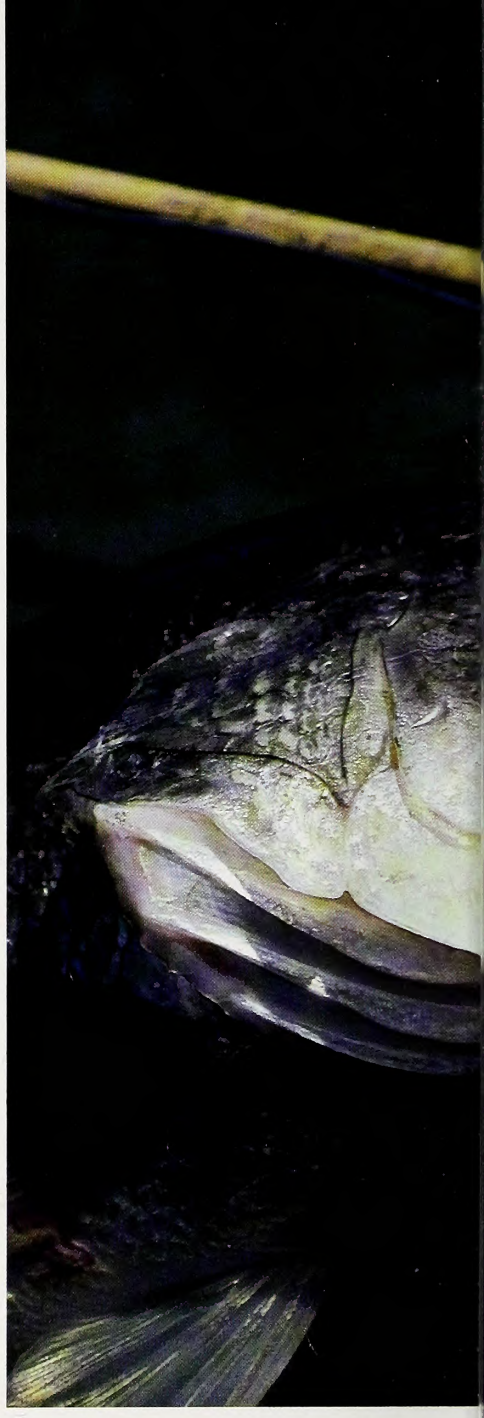
If you use only a steady retrieve, you will overlook one of the most effective methods that takes advantage of the flutter effect of the spinner blades as the bait is sinking. The spinner blade rotates while the lure is sinking, giving off flash and vibration and slowing the fall. This attracts bass, and often the strike comes while the bait is dropping. I think the single-bladed spinnerbait works better as a drop bait. With a tandem spin, the two blades seem to interfere with each other.

Also, the single spin transfers a better throbbing feel to the rod tip during the retrieve which helps you to keep in touch with the lure. Sometimes the only hint of a strike during the drop comes when the throbbing spinner suddenly stops spinning or skips a few beats. Or a strike may be signaled by a twitch of the line, so you have to pay close attention while using this technique.

One type of retrieve that utilizes the drop is a lift and fall motion that sort of bounces the lure along the bottom. You can also retrieve the spinnerbait right up alongside some cover and let it fall. You can keep the spinnerbait fluttering alongside the cover longer by lowering the rod tip to follow the lure down on a tight line.

Any kind of retrieve can be made more effective by bumping the bait off some sort of structure. The spinnerbait will usually bump off stumps and rocks and climb over submerged limbs without hanging up. The sudden extra flash, change in vibration, or burst of speed caused by bumping the bait will often trigger strikes.

I don't believe that you need a lot of different colored spinnerbaits to catch bass. With a lure that puts out so much flash and vibration, color is probably not too important. For me, the old rule for lure colors has always worked well. Under bright (sunny) conditions, use light-colored lures. Under dark conditions, use dark colors. Among light colors, a nickel-plated spinner blade with a white skirt is good. Substitute chartreuse-colored skirts if the water is murky. My favorite dark colors include copper blades with blue, brown, or black skirts, either in solid colors or in combination with yellow or chartreuse. Around rocks, I like a brown/orange that seems to resemble a crawfish.



***This 6-pound largemouth** was caught on a tinsel-tailed spinnerbait in March. Spinnerbaits are especially effective in early spring, and remain a good choice throughout the season in water that isn't too clear.*

Often, I have seen one of my fishing partners stick with his favorite color regardless of conditions and outfish my color matching efforts, so color is not always critical. If I had to pick one favorite color with a proven record of catching bass, it would be a solid

white skirted model with hammered nickel plated blades.

In recent years, there's been a lot of hype about willow-shaped spinner blades. The advantages of willow-shaped blades are that they present a larger-looking lure, put out more flash, and tend to collect slightly less trash around the spinner. They are also a little less tiresome to retrieve because the blades rotate in a more narrow radius, thus providing less resistance against the water. Willow-leaf spinnerbaits can be useful at times, but the conventional Colorado-bladed models are more versatile, and I also think they are usually more productive.

Most spinnerbaits come in ¼-, ⅜-, and ½-ounce sizes. The lighter weight lands more quietly, runs shallower, and is less straining to retrieve, while the heavier sizes work better on windy days or in deep water with heavier baitcasting tackle. The heavier spinnerbaits can also be fired back through the small limbs of overhanging bushes to penetrate the secluded spots where the big bass might lie.

All sizes can be made to land more softly by throwing a low trajectory cast and starting the retrieve just before the lure hits the water. I've practiced a sort of sidearm, underhand cast that seems to work well, and it also helps me cast under overhanging cover along the bank. You know when you have done it right when the blades land with only a gentle slap on the surface, just like a baitfish jumping out of the water.

Perhaps the most important thing you will notice about spinnerbaits is how much fun they are to fish. Their semi-weedless properties make them very forgiving on errant casts. Furthermore, you can do all sorts of home tinkering to customize these lures, and there are many accessories like extra blades and skirts on the market.

After you have used these lures for awhile, you will almost surely appreciate the many ways you can fish them. Eventually, you may even find yourself seeking the "right" water conditions just so you can use them. And, you might also wind up with a tackle box full of spinnerbaits. How do I know these things? It's better not to ask. ⊠

SENTINELS ALONG THE COAST

Seven lighthouses tower above North Carolina's barrier islands, some still casting their revolving shaft of light seaward to remind sailors that a heritage of danger lingers on these shoals.

by Lawrence S. Earley
photography by Ken Taylor

The first lighthouse was no doubt a bonfire on some coastal Mediterranean hill, tended by the first lighthouse keeper, the fisherman's friend, spouse or brother. Whoever it was, he or she was onto something. Thousands of years later, a beacon burning through the darkness on a stormy night still means a lot to a man in a boat. As one sailor put it, "Suddenly he sees that he is no longer alone in the midst of the ocean waves: he sees that people are caring for him with paternal solicitude."

Over the years, many mariners have shared these feelings as they entered North Carolina's treacherous coastal waters and caught the bright beam of light from one of its lighthouses. Today seven lighthouses still keep a watch along the shore, six of which are still in operation. Brick rubble amid the sea oats marks the locations of several others that were destroyed or replaced through the years. Three light stations offshore still mark dangerous shoals, and on coastal rivers and sounds steel towers bearing automated beacons help ships through the night.

The history of lighthouse technology is really the search for a clean fuel and a mechanism that would cast the light far out to sea. For the greatest part of its history, the light was a variation on the flame. At first, wood was burned to create the light but wood fires had their disadvantages, namely the need for a large wood supply and constant attendance. Coal, another early fuel, coated the silvered reflectors with soot which had to be cleaned frequently. Candles had only a brief day as a light source.

Early in the 19th century, the development of oil-burning lamps and glass reflectors was a great step forward in lighthouse technology. Then in 1822 a French inventor, Augustin Fresnel, devised what became known as the Fresnel lens. This improvement intensified the light from lamps burning oil — sperm oil, rapeseed oil, lard oil or porpoise oil — and threw it farther to sea. American lighthouses were equipped with the Fresnel lenses in the 1850s and with their aid some of our 19th-century lights could be seen 15 miles at sea.

In keeping with tradition (and a steady societal discrimination), most lightkeepers were men, but sometimes women were able to penetrate the inner sanctum. At the turn of the century, for example, Charlotte

In 1809, the *American Coast Pilot* warned, "Cape Lookout is very low and cannot be seen more than three leagues in the clearest weather from on board a small vessel." Three years later the first of two lighthouses was erected at Cape Lookout to warn seamen of these dangerous shoals off Core Banks. As with the Hatteras light and the Bodie Island light, the first structure was flawed. One skipper wrote, "The lights on Hatteras, Lookout and Cape Florida, if not improved, had better be dispensed with as the navigator is apt to run ashore looking for them." In 1859 a second lighthouse was constructed, one that would become the model for the lighthouses at Cape Hatteras, Bodie Island and Corolla.

Mason, the assistant keeper at the Cape Lookout Lighthouse, became head keeper in all but title on the death of the previous head keeper, her father. Whether man or woman, the lightkeeper drew a pittance for a salary. In 1812, President James Madison appointed James Fulford the first keeper of the Cape Lookout light at a yearly stipend of $300. One hundred years later the average salary for the position had improved to a robust $600.

The lighthouse keeper's life was hard, but not because of the physical work demanded. Perhaps the most arduous task was carrying oil each afternoon from the oilhouse below the tower up the spiral stairs to the lamphouse. Although one 19th-century Cape Lookout keeper was disabled after a fall while performing this chore, such accidents were rare. The keeper made sure the lamp wicks were lit, kept them trimmed and cleaned the reflectors. Dirty reflectors reduced the intensity of the beam and created hazardous conditions for mariners.

It was loneliness that was hardest on the keeper and his family. According to one keeper, reflecting on his daily grind, "The trouble with our life here is that we have too much time to think." Perhaps it was loneliness and monotony that was responsible for lights dimming in the middle of the night while the keeper snored. In 1872, one assistant keeper at Cape Hatteras was sacked when he was found sleeping on the job. As an antidote to boredom, the Lighthouse Board, which administered lighthouse operations, distributed in 1876 a shelf of edifying magazines and books to each station. The possibility that such volumes as *The Five Little Peppers and How They Grew* induced rather than forestalled sleep is only idle speculation.

Of course, lights sometimes went out for reasons not of the keeper's making. No sooner was the third Bodie Island lighthouse completed in 1872, for example, than a flock of geese flew through the glass of the lamphouse, damaging the lens.

Today the U.S. Coast Guard administers lighthouse matters and incandescent light bulbs have replaced the oil and gas lamps. Keepers no longer have to stay awake through the long and generally uneventful nights. If a 1000-watt bulb burns out, another automatically swings into place.

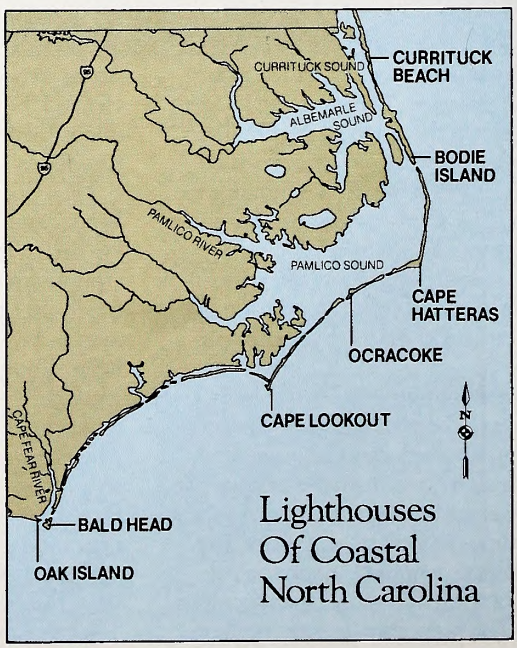
No matter the source of the light, however, North Carolina's sentinel lighthouses continue to cast a long beam of hope and encouragement to those at sea, as they've done since the days of the first fire on a hill.

Bodie Island lighthouse

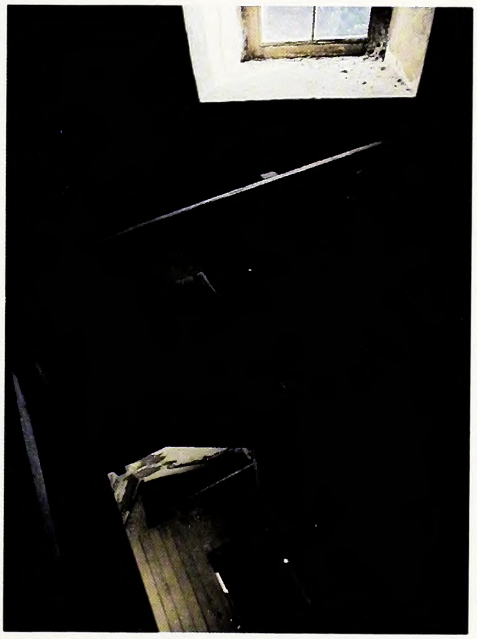
Sunrise, Bodie Island lighthouse

Fresnel lens, Bodie Island light

Bodie Island was perhaps the most ill-fated of all the lighthouse sites in the state. Between 1848 and 1872, three lighthouses were built on the island. The first developed an unfortunate lean; the second, structurally sounder, was blown up by retreating Confederate troops in 1861. The third was built in 1872 following the completion of the Hatteras light. It, too, took its design from the Cape Lookout lighthouse. Conical in shape and 161 feet high, it sports the horizontal bands that distinguish it from the other major lighthouses along our coast. Its flashing light is visible 18 miles at sea.



Bald Head Island lighthouse



Stairwell to Bald Head lighthouse

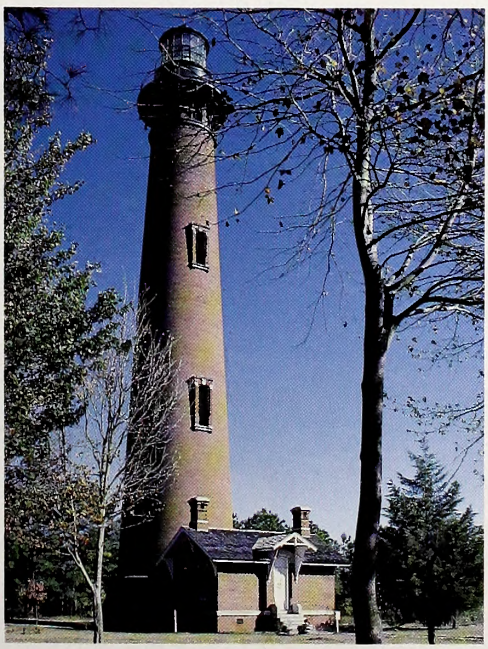
North Carolina's first lighthouse, Bald Head lighthouse, was built in 1795 on Smith Island, a large island at the mouth of the Cape Fear River. There lay the lethal Frying Pan Shoals and the shifting channels and sandbars that frequently sunk ships bound upriver. The first lighthouse at Bald Head had waves lapping at its foundation stones soon after it was built, necessitating a second lighthouse that was built in 1818. A six-story, 110-foot-high octagonal brick tower, "Old Baldy" is the oldest lighthouse structure in North Carolina. It was deactivated in 1958 when a modern lighthouse was constructed on nearby Oak Island.

Ocracoke lighthouse

Stairwell to Ocracoke lighthouse

The oldest lighthouse still in service in North Carolina today is the Ocracoke lighthouse. For many years, ships bound for Edenton, Bath and other river ports entered Pamlico Sound by way of Ocracoke Inlet. A lighthouse constructed on Shell Island, just inside the inlet, was the first to answer the need for illumination, but within a few years shifting channels made that light ineffective. Although Ocracoke's lighthouse had been authorized in 1790, it wasn't built until 1823. The whitewashed brick and mortar tower rises 65 feet above sea level and casts an 8,000 candle-power light 14 miles out to sea.

Currituck Beach lighthouse



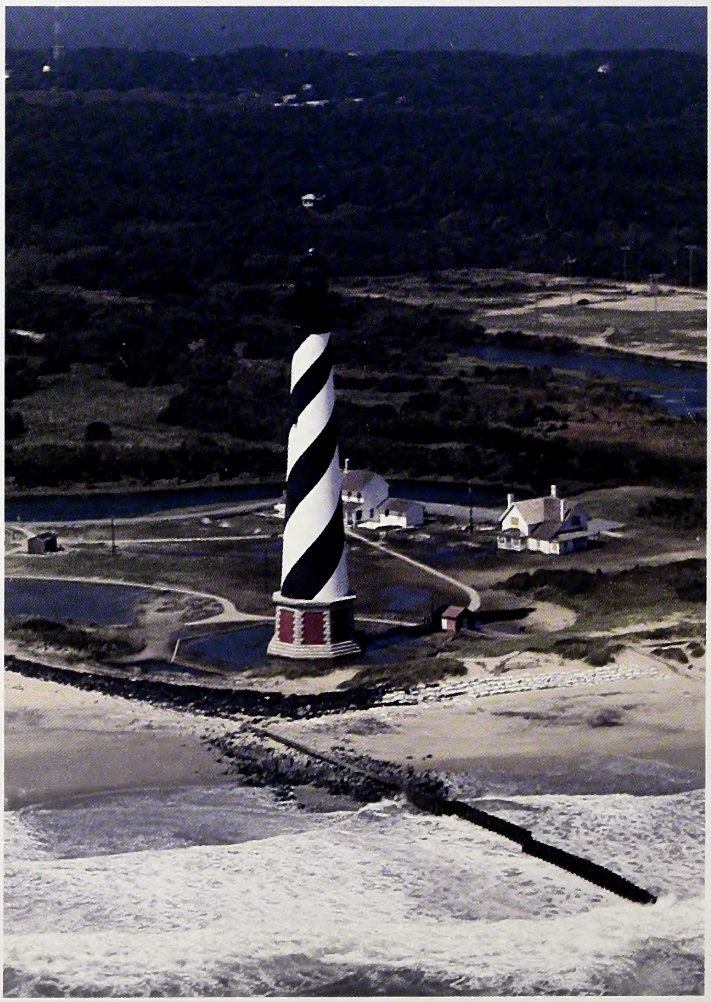
By the 1870s, a string of lighthouses had been constructed along the Atlantic coast, but between the lighthouses at Cape Henry in Virginia and Bodie Island lay 40 miles of unlit coastline. In 1875, the Currituck Beach lighthouse was constructed to complete the lighted coverage. Indeed this structure, located at Corolla, was the last major lighthouse built on the South Atlantic coast. Like the lighthouses at Bodie Island, Cape Hatteras and Cape Lookout, the tower was constructed of brick. Unlike them it was left unpainted to make it distinguishable from the others. Its bright light can be seen 15 miles at sea.

Early morning, Currituck Beach lighthouse

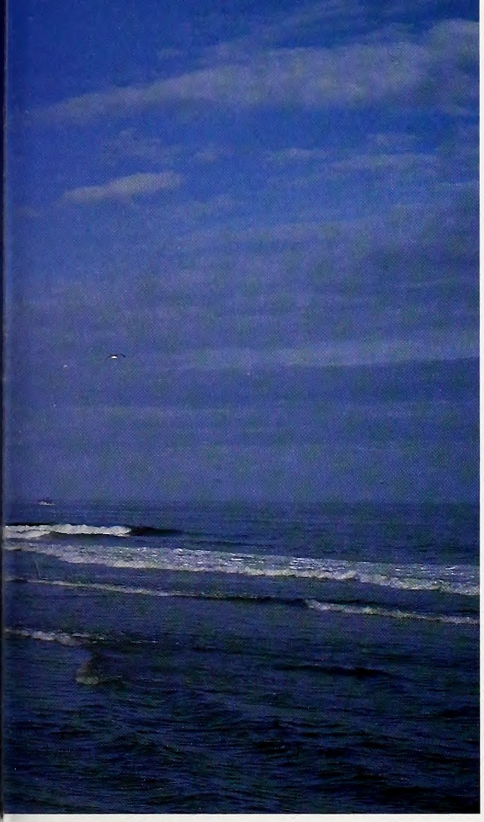
Cape Hatteras lighthouse

From Cape Hatteras, treacherous sand bars jut out to form Diamond Shoals, justly feared for centuries by mariners. In these tempestuous waters, several hundred ships have foundered, giving the immediate area (and by extension the entire North Carolina coast) the name "Graveyard of the Atlantic." The first lighthouse at the site was completed in 1802, the second lighthouse on the North Carolina coast. Captains complained about the intensity of the light, however, and in 1870 a second light was built at the site. Two hundred and eight feet tall, the Hatteras light is the tallest brick lighthouse in the country.

It is also one of the most vulnerable. The foundations of the structure originally lay 1,500 feet from the ocean. But by 1935 the water had crept so close that the lighthouse was abandoned and only reactivated in 1950. Today, as waves again threaten it, controversy rages over rival means of saving the historic structure. Some want to build a seawall around the lighthouse, while others believe that only by moving it inland on rails will it be saved.



Erosion at Hatteras lighthouse



Cleaning Cape Hatteras lighthouse

Reveille, Oak Island lighthouse

Several lighthouses were built on Oak Island in the middle of the 19th century. These lights were considered essential to guiding ships out to sea from the Cape Fear River. A modern lighthouse was erected on Oak Island in 1958 to replace the Bald Head light.

Season of Shad

From distant parts of the Atlantic, herring and shad ascend our coastal rivers to spawn. Their annual appearance also spawns local rites of spring, not to mention some darn good sport fishing.

by Jim Dean / photography by Ken Taylor

The arrival of spring is not always signaled by robins on the lawn or smears of lavender redbud along the roadside. For a comparatively small number of us who live in eastern North Carolina, spring arrives in flooded rivers. It's something most of us sense rather than see, although in the clearer streams we might be able to spot the glitter of silver as schools of herring and shad buck the current, flashing deep like tumbling coins as they move upstream to their traditional spawning grounds. These fish are anadromous, meaning that they spawn in freshwater rivers or in their flooded backwaters, but return after

***Fishermen net an** American or white shad below one of the three locks on the Cape Fear River (left). A feisty hickory shad (above) is landed by this angler near the mouth of Contentnea Creek. Hickories are great fun on ultra-light tackle, often leaping clear of the water.*

For many shad fishermen, *an enjoyable part of this annual rite of spring is frying the catch to a crisp turn in hot oil on the banks of the creek. These anglers are cooking hickory shad.*

spawning to the ocean where they remain until the following spring.

On some eastern rivers, particularly the lower Roanoke and Chowan, the arrival of shad is an annual boon to commercial fishermen who set nets and sell the catch. Some shad are processed and shipped out, while other sales are made right on the bank of the river. It is a gala event that draws spectators who visit the river landings to bask in the pale spring sunlight and watch the net tenders.

The shad runs, and especially the runs of their smaller herring cousins, also spawn another colorful and tasty seasonal tradition. Huge cast iron pots heat cooking oil over fires on the shoreline, and herring and roe are deep-fried and served with hush puppies and coleslaw. I recall one memorable meal in the Cypress Grill on the banks of the Roanoke at Jamesville, a wooden building serving fried herring only during the spring runs.

Hickory shad run larger than herring, averaging 1- to 2-pounds, and they are also deep-fried along the banks by some fishermen. But it is American or white shad that commands the greatest attention in the rivers that host them. American shad average perhaps 2 to 4 pounds with the males running much smaller than the females. Female American shad often weigh more than 5 pounds, and reach weights of at least 13 pounds. These shad are prized for delicate, white meat that is especially tasty when baked. The roe of all three — herring, hickories and American shad — is in great demand.

It is not, however, the commercial fishing and "fried on the riverside" appeal that marks spring for North Carolina's sport fishermen. Rather, it's the fact that all three species can be caught on hook and line using light tackle and tiny leadhead jigs or spoons. Spring sport fishing for shad, especially, approaches a frenzy in some parts of the east where the runs have traditionally been heavy. The town of Grifton sponsors a shad festival each spring with prizes given to anglers who catch the first and largest hickory shad in the nearby Neuse River or its tributaries, Contentnea, Pitchkettle and Grindle creeks.

One March afternoon several years ago at the mouth of Pitchkettle Creek, I launched a 12-foot aluminum boat and motored upstream a short distance before anchoring. Using ultra-light spinning tackle with spoons and small jigs called darts, I caught over 20 hickories in little more than an hour. Hickory shad may not be large, but they more than make up for it on light tackle by leaping clear of the water frequently.

While hickory shad are the dominant species in this area, other rivers are favored by the larger American shad. For many years, the Tar River at Rocky Mount behind Bob Melton's Bar-B-Que has been a favorite spot. Anglers line the banks or stand on platforms, casting jigs and spoons into the river. When a school of shad passes, fishing can be fast and furious, but there are often long periods when action is slow. Unfortunately, in recent years, the runs on this stretch of river have diminished drastically.

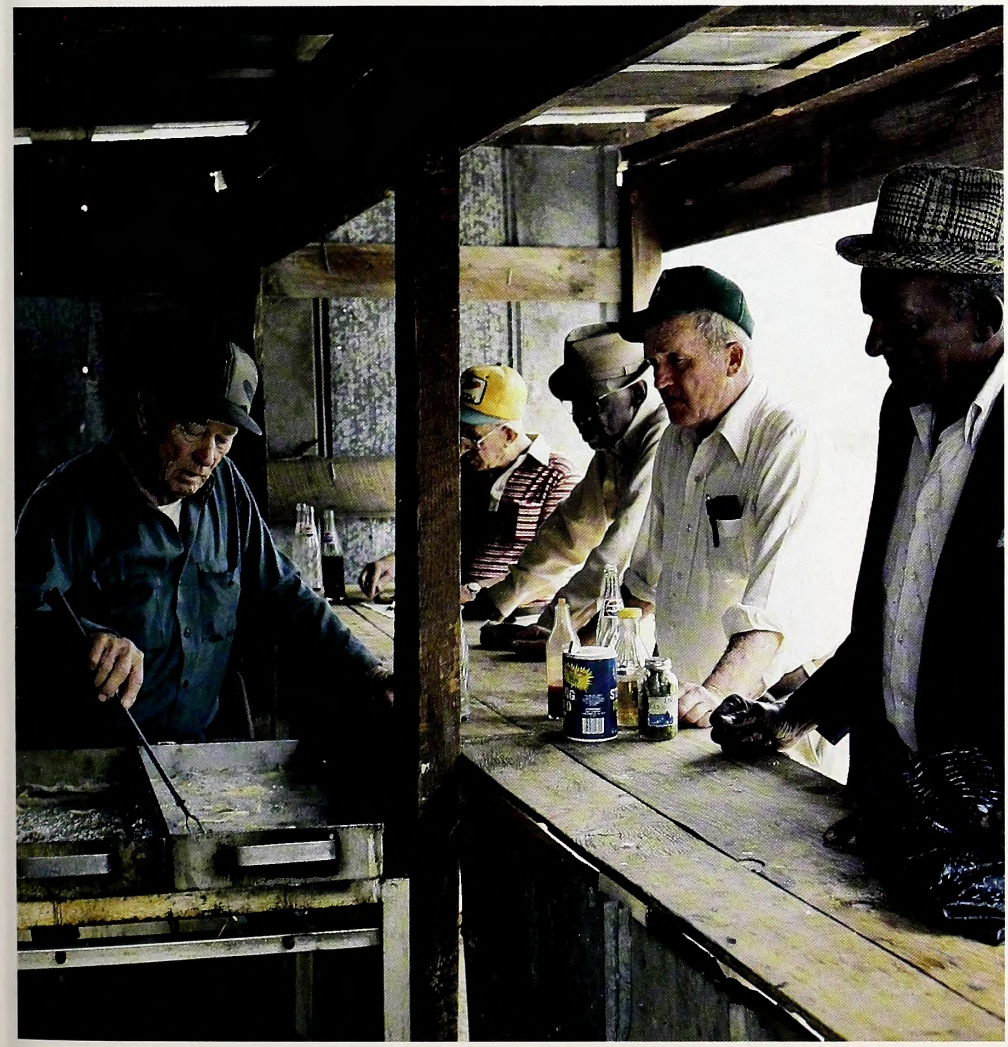
More reliable have been the runs of American shad in the Cape Fear River just below the three locks near Wilmington, Elizabethtown and Fayetteville. Although herring usually enter the coastal rivers first, followed by hickories and then American shad, sport fishing for American shad often gets underway at the lower lock just above Wilmington as early as February, progressing upstream steadily as the weeks pass.

I have had excellent luck in March and April at the lower two locks, and once caught the tail end of the fishing as late as mid-May at the upper lock.

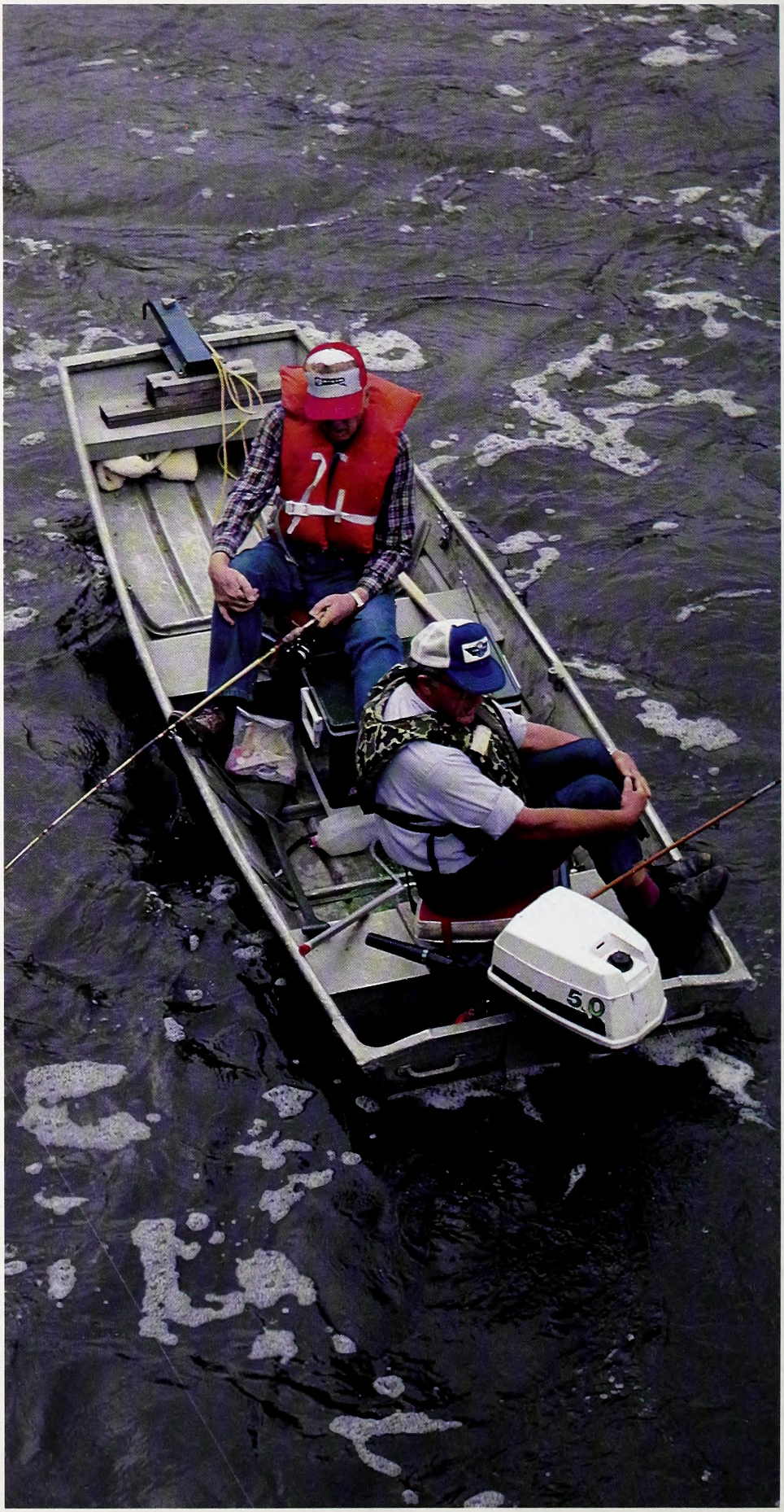
The history of shad fishing in the Cape Fear parallels the wax and wane of shad fishing throughout North Carolina. In 1961, the N.C. Wildlife Resources Commission and the U.S. Army Corps of Engineers began a cooperative seasonal project to literally "lock" the schools of spawning shad upstream past the low dams. By opening the gates of the locks partly to ensure a flow, shad were enticed into the locks and could continue their upstream spawning run. This effort, still underway each year, restored the spawning runs in the upper Cape Fear.

The return of good fishing in the Cape Fear in the '60s occurred at a time when shad fishing was increasing on other coastal rivers, notably the Tar at Rocky Mount, the Neuse and tributaries at Grifton and in the Chowan. Venturesome anglers also tapped runs in other coastal rivers including the Northeast Cape Fear, Trent and Whiteoak rivers.

Sport fishing for shad soon became a mania that attracted a growing number of aficionados. In more recent years, however, interest seems to have fallen again. Part of that decline can undoubtedly be explained by dwindling shad runs in some rivers. Channelization projects throughout much of eastern North Carolina reduced spring flooding believed to be necessary for successful spawning in the bottomlands adjacent to rivers and streams. The construction of large impoundments on some watersheds may also be partly responsible. Some believe, for example, that an apparent decline in the Cape Fear shad fishery may be traced to Jordan Lake which now controls some of the annual spring flooding on the



The best hickory shad *fishing usually occurs in March in high, relatively clear water. High water that floods the nearby swamps favors shad spawning. These anglers on Contentnea Creek (above) have almost ideal conditions. During the spring spawning runs of herring and shad, it isn't uncommon to find seasonal entrepreneurs cooking and selling fried fish on the banks of streams and rivers. These patrons (left) are bellying up for a feast below Grifton.*



Two anglers fish *for American shad in the foamy currents below one of the Cape Fear River locks. The preferred technique is to cast a dart and spoon rigged in tandem upstream and across, and retrieve steadily as the lures sweep downstream near the bottom.*

river — flooding that may have been vital to the shad.

Pollution is also considered a likely culprit on some waters, and some anglers and experts suspect commercial fishing at sea by foreign fleets may have played a part.

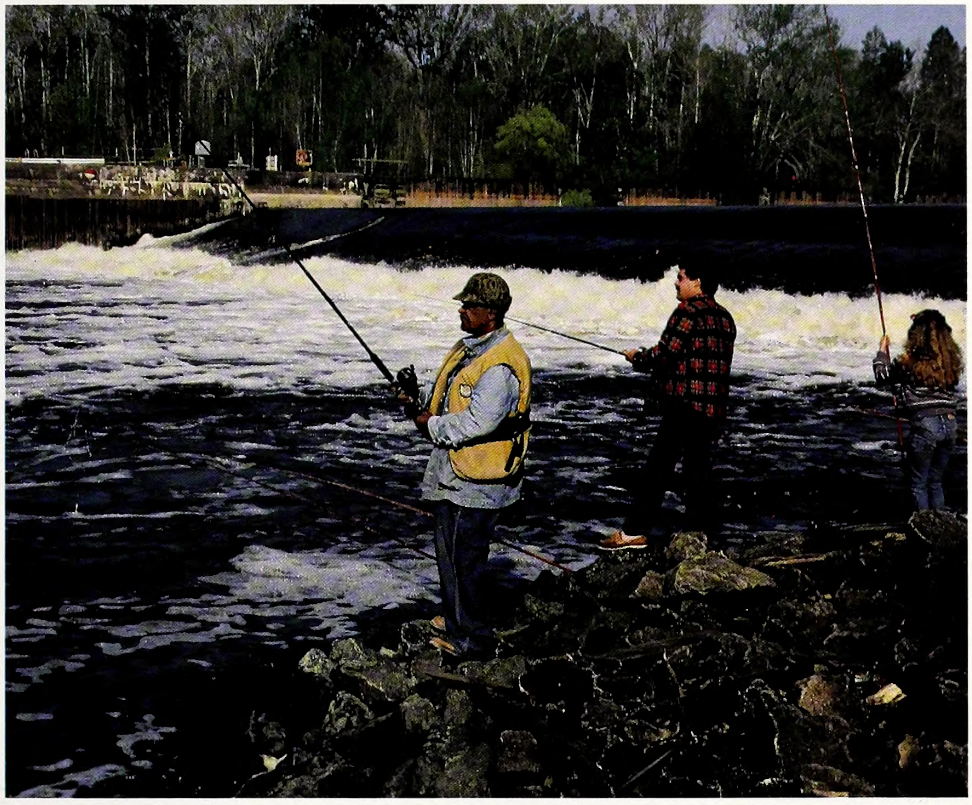
Yet, even in areas where shad fishing remains good, angler interest seems to have leveled off or diminished. Perhaps it's the nature of the fishing. At best, shad fishing with hook and line has always been chancy. So much depends upon proper water levels at key times. Water clarity is also a factor — it should be at least clear enough for fish to see the lure. Weather is by no means a minor player, and the major runs of shad often pass not only on freshets too high and roily to fish, but at times when the weather is simply too raw for comfort.

Would-be shad fishermen who don't have up-to-the-minute information, or who cannot drop everything and go precisely when the time is right are likely to have poor luck. After a couple of fishless trips halfway across the state, some anglers have become discouraged and found other ways to celebrate spring.

Those who manage to catch the fishing at its peak, however, don't soon forget it. For those who aren't terminally discouraged, or who want to try it for the first time, March is perhaps the most reliable month if water levels and weather cooperate.

As for tackle, you'll find that an ultra-light or light spinning outfit with 4- or 6-pound test line is sporty and more than adequate for herring and hickory shad except in the swiftest currents. For the larger American shad, stouter tackle is usually a good idea, although ultra-light will handle most fish if there are no obstructions in the river and your reel has a good drag. Most anglers, however, opt for medium-weight spinning tackle with 8- or 10-pound test line on reels with good drags. A sturdy, wide-mouthed net is essential.

Lure choice is related to the size of the fish and also to the particular river you're fishing. Generally, herring and hickory shad prefer small darts and spoons, although hickories will also readily take the popular larger No. 1 Reflecto spoon. American shad also like this spoon but prefer larger darts. It pays to see what local experts are using because shad can be strangely selective even though, like salmon, they are not thought to eat anything during their spawning runs. In many rivers, white darts with red heads and yellow tails are good, and that's usually a good choice to start with. Fluorescent green and yellow darts are favored by shad some days and in some rivers, as are other color combinations. Likewise, shad in some rivers seem to prefer silver spoons, while others prefer gold or copper. A red bead threaded on the line just ahead of the spoon seems to make a difference at times.



***Although boat fishermen** are often in a better position to catch shad on their upstream spawning runs, bank fishermen can also get in on the action, especially below one of the three locks on the Cape Fear River.*

Most successful fishermen fish two lures at the same time in tandem, giving the shad a choice. The most common rig seen is a dart rigged about a foot ahead of a trailing spoon.

The fishing technique rarely changes. Most anglers cast slightly upstream and across, and retrieve slowly and steadily. The strike often comes just as the lures complete their downstream sweep and are retrieved upstream. Some anglers impart a slightly erratic action to their lures, but most feel a steady retrieve is best.

Trolling also works, though it is less often employed. However, in swift currents, some anglers have made amazing catches by simply letting their lures trail in the current behind an anchored boat.

Although fly casting with small, brightly colored flies on sinking lines is popular in fairly shallow, rocky and clear streams in the Northeast, it has never proven as successful in our higher, often discolored rivers. If you're determined to try it, however, you will catch some fish under ideal conditions.

Whether sport fishing for shad will again achieve the popularity it enjoyed in the 1970s is uncertain, and may very well depend on how well we protect our dwindling runs. But it's still an exciting sport for those who take the trouble to try it — and don't mind an occasional fishless and frustrating trip. For some of us, at least, it's still a favorite way to say goodbye to winter. ⊠

Harbingers of SPRING

You don't need a calendar to chart the arrival of the vernal equinox. Welcome proof of life's renewal is all around us this time of year.

written and photographed by Harry Ellis

Each year, we are privileged to witness that most venerable of all miracles, life's renewal and rebirth after the seemingly eternal death of winter — the annual pageant of spring.

The vernal equinox — the official beginning of spring as set down on our calendars and almanacs — is a matter of astronomical order and mechanics. It occurs on or near the 21st of March at the precise moment that the sun crosses the celestial equator, when, everywhere, the days and nights are equal in length. From that time on, the days grow longer and the nights shorter until the summer solstice, on or about June 21.

But no one really needs a calendar date to be reminded of the arrival of spring, which gradually sweeps over the land in an enveloping flood of action and color, fragrance and song. Our North Carolina springs are marked, from region to region, by an amazing diversity, flavor and uniqueness found in few other states.

Though the month of February can be one of our coldest, we often see intervals near its end that suggest that the chains of winter are being loosened. A faint, warm softness is in the wind as it races through the woods stirring up the brown leaves. Then comes the sound of trickling water as the ice begins to melt. Tiny rivulets course down the hillsides, and the little brooks, running full, sing a vernal song. In the air is a pervasive odor of thawing earth and new-turned soil, of pine needles and balsam warmed by the sun. You sense that somewhere deep in the earth life is beginning to stir again. Even if more snow should come, winter is beginning to lose its grip. Great horned owls begin nesting in late February on the high ridges above my house; I can hear their booming calls in the night. Kildeers are crying and running over the thawing furrows searching for worms, red-winged blackbirds are returning to the marshes, and the first robins have been seen. Not spring yet, but the promise is there.

In March, the great seasonal unfolding of life continues. The time of winter gales has passed, and

Fringed polygala *(above) is a mountain member of the milkwort family found in small beds from April through June. Relatively rare fringed phacelia (right) graces the floor of a mountain forest in April or May.*

A wood thrush *laid these bright blue eggs in a nest in dense mountain shrubbery. These birds are common throughout our forests, and are known for their melodic song.*

Harbingers of SPRING

Spring peepers *(below, left) are more often heard than seen, and the songs of thousands of these tiny frogs are one of the first audible harbingers of spring. A white-footed mouse (below) cautiously pokes its head out of a knothole. These small animals often live in abandoned squirrel or bird nests and in winter will forage for food under the snow.*

everywhere sap is running, buds are swelling, grass is greening, the surge of life is quickening, and the earth is alive again. The first wildflowers are beginning to bloom in the leafless woods, — hepaticas, trout lilies, bloodroot, and trailing arbutus. Pussy willow catkins, gold with pollen, blow in the wind, and red maples lift their crimson blossoms to the sun. Spotted salamanders are making their annual migrations from the woods and hills to the vernal breeding ponds, sometimes more than a quarter mile away, leaving their gelatinous egg-clusters floating on the surface. Mockingbirds are whistling the tunes of spring, and those little piping notes, audible under the roar of the March wind, are coming from the season's first bluebirds. The voices of the spring peepers *(Hyla crucifer)* are rising from every marsh and bog in the land. When these little frogs awake from hibernation and inflate their throats in song, you can be sure that winter is over and gone. Year after year, we listen for the call of the first peeper and symbolize it as the very voice of spring. It is one of the oldest sounds on earth. Long before there was bird song, when our earth was still in its own springtime, the cries of the peepers must have arisen from the ancient marshes.

Spring always comes stealing out of the south, up from Florida, through Georgia and the Carolinas, and northward. With spring comes breezes soft and fragrant, filling the woods with wildflowers, bringing hordes of migrating birds, and waking in crevice and burrow, countless millions of hibernating creatures. Everywhere there is budding and blooming, mating and birthing. Scientists tell us that spring moves north at the rate of approximately 15 miles a day; one could walk at a leisurely pace and keep up with its advance.

Not only do plants and animals respond to the call of spring, but people are also renewed. They emerge from the oblivion of winter to sit on porches or lean over fences conversing with neighbors. During the day, there are spring chores to be done — plowing, planting, mending fences. Crops are planted with high hopes for the harvest. Something is abroad in spring that inspires confidence, making people believe that almost anything is possible.

The onward sweeping tide of spring flows upward from the lowlands and valleys, enveloping the trees in a mist of green and filling the Blue Ridge woodlands of April and early May with many kinds of trilliums, violets, azaleas, the snowy blossoms of flowering dogwood, and with pink carpets of spring beauties. Masses of fringed phacelia, like new-fallen snow, whiten the ground. In orchards and around country farmhouses, apple trees are arrayed in pink and white, with always the roar of bees through the branches. Swiftly bloom the flowers of spring and swiftly they fade, their evanescent beauty lasting only a few days at most. Today their blossoms open and may be gone within the week.

The first fledglings have left the nest and are on the wing; baby cottontails lie hidden in fur-lined nests; young squirrels peek wide-eyed from knotholes in hollow trees. Spring, indeed, belongs to the young! It is a season of new beginnings.

May is the month of bird song. When the first faint streamers of light show in the east, the morning symphony begins — a hallelujah chorus to an awakening world. Though it is still too dark to clearly see the performers, many of them can be identified by their voices: Rising above the loud, harsh screams of the blue jays, there are the "wake-up, weary," "cheer-up, cheery" notes of the robin,

Harbingers of SPRING

The blooming of *flame azaleas signals the arrival of spring in the high mountains. Many people consider it our most beautiful native flowering shrub.*

the "purity," "purity" of the bluebird, the "plow it," "plow it," "hoe it," "hoe it" of the brown thrasher, the "sweet, sweet, bitter" of the song sparrow, and the silver-toned "ee-o-lay" of the wood thrush. Not until the sun climbs above the horizon does the concert end.

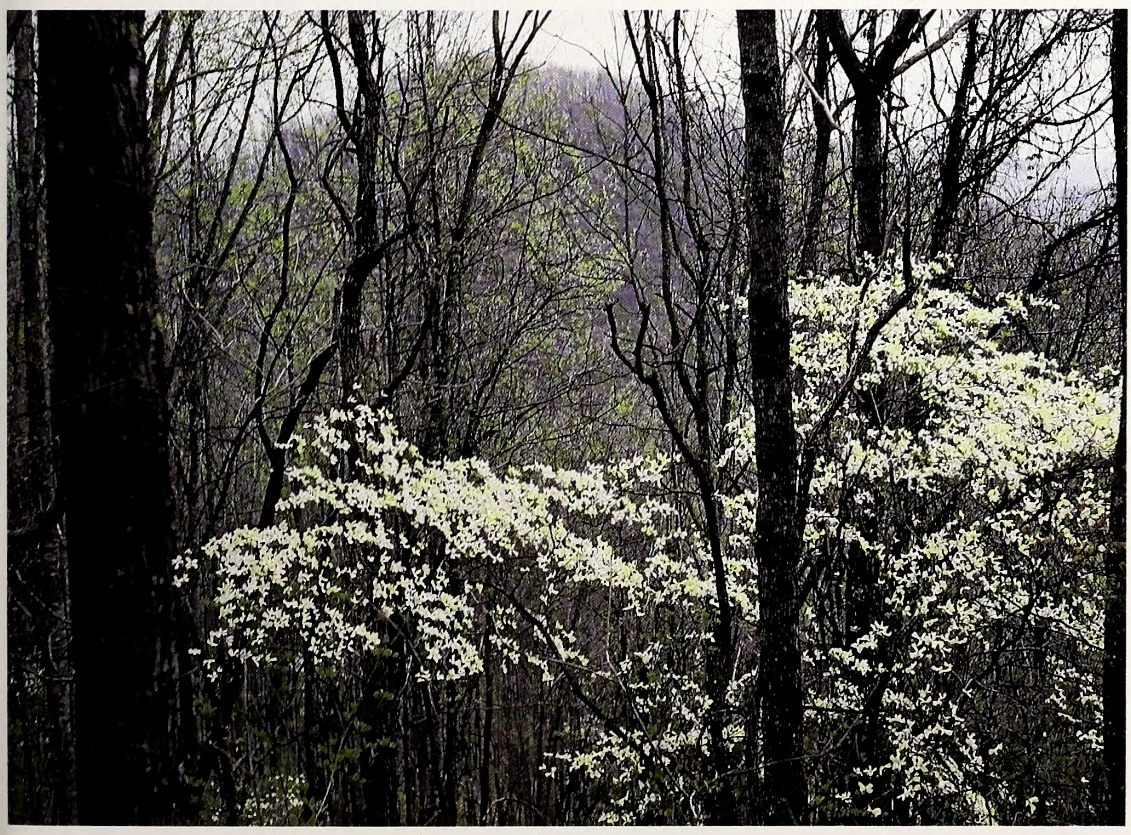
During the high-tide of the northward migration in the month of May, great waves of warblers come in during the night. In the morning I find them flashing through my backyard trees, searching for insects. From the jungles of Central and South America they have flown, most of them en route to nesting grounds in the far north, stopping for a brief period of resting and feeding before resuming their jouneys. I can only wonder how they so unerringly find their ways, and what force draws their restless wings across the forests and seas. Are they endowed with some kind of extra super-sense, outside the human dimension and utterly beyond our comprehension? In a day or two they are gone, but the riddle endures.

As May slips into June, the meadows are white with daisies and alive with clouds of butterflies, flitting through the flowers. In late summer, many of the butterflies that I see have wings that are faded and torn, but now, all of them are fresh and bright and beautiful, with every scale on their wings intact. All across the fields, butterflies are going through their endless cycles of metamorphosis — from egg to caterpillar, to butterfly and back to egg again, the full circle.

Late spring twilights are made magic by fireflies as they go winking and blinking over the fragrant meadows. From woodland ponds come the deep-toned "jug-o-rum" notes of the bullfrogs, as they tune their voices for the evening concert. On whispering wings, owls glide through the darkness, and the cries of whippoorwills drift down from the wooded hills.

The spring stars stand out clear and bright across the heavens. Ursa Major, the Big Dipper, hangs high overhead, Orion is low in the southwest, and the Milky Way stretches over the black dome of the sky like an immense luminous necklace.

Before we hardly realize it, spring is slipping away and with it will go something infinitely rare and precious, that will not pass our way again for an entire year. Before that time, another summer, autumn and winter will pass. And many a howling gale will beset us before the peepers cry again from the marshes. Like the ocean's tides, the seasons come and go and come again in an unending sequence, and just as the cold of winter must eventually pass, so, in due time, the splendor and grandeur of another spring will come—a treasure worth waiting for and dreaming about for a whole year. ⊠



***Spring beauties** (above) deliver all their name promise. Beds of these beautiful pink flowers are found throughout our Piedmont and mountain forests. Flowering dogwoods (below) are among the most common small trees found in our forests. A rising tide of white marks spring's movement up the mountainsides.*

Causes Are Complex

Small-Game Decline Studied

Written and Edited by Mark Taylor

Changes in habitat, predation and pesticides may all be major factors in the decline of quail and rabbits in the Southeast. These threats were discussed by wildlife biologists from across the Southeast at the Southeastern Small Game Workshop.

Biologists from the Tall Timbers Research Station in Florida, a private organization dedicated to the study of wildlife and land management, noted that they had visited and evaluated the habitat of 16 managed quail courses in North and South Carolina, Alabama, and Florida. The highest quail populations they found were on areas that were moderately well drained and had very fertile soil. The lowest populations were found on dry, sandy soils and in wet, flat woods. However, areas with a mix of woodlands, old fields, agricultural fields, and escape cover and wild foods had the highest quail populations.

Perhaps surprisingly, predation may also be a significant factor in quail declines. Paul Curtis, a researcher at N.C. State University who has studied quail populations on the Fort Bragg Military Reservation, found that only 19 percent of his radio-marked birds survived the winter, and only 2- to 4-percent survived a year. During the winter, spring and fall, 50 percent of the study birds were killed by avian predators, such as hawks and owls, and 30 percent were killed by mammals. In the summer months, 100 percent of the mortality was caused by predation.

Several studies are under way comparing the survival of birds exposed to normal spraying of pesticides to those which are not exposed. Quail routinely feed in fields in the spring and summer when chemicals are used the most. Although today's pesticides rarely cause outright mortality in wildlife, some biologists feel that exposure may result in a short 'pesticide hangover' which makes the birds sluggish and less alert.

"The range of studies presented at this conference shows that the causes of this decline are probably very complex," said Terry Sharpe, small-game project leader for the Wildlife Commission, who helped organize the conference. "For example, the habitat evaluations done by Tall Timbers show that you need good land to produce high quail populations. This in itself isn't enough, though. Land must be managed so that other habitat components — such as wild foods, mixed forests and old fields, small agricultural fields or food plots, and escape and nesting cover — are arranged so that the birds can easily use them. Also, the impacts of predation may not only reflect population increases in natural predators such as hawks, owls, foxes and feral dogs and cats, but may also reflect changes in habitat. Increased urbanization, and a trend toward larger farms, has fragmented much of our wildlife habitat. When predators discover an area with high quail populations, they may concentrate in growing numbers on that area until the good hunting is gone."

Biologists at the conference also discussed steps that could be taken to improve small game populations. Further studies of the biology of quail, their habitat needs, and predation are needed.

Slated For March 20-26

Forests Focus Of National Wildlife Week

CURTIS WOOTEN

Valued Resource: *"Forests Are More Than Just Trees" is the theme of this year's National Wildlife Week, which will be observed from March 20-26. Educational materials concerning forests and conservation are available by writing National Wildlife Week, National Wildlife Federation, 1412 16th St. N.W., Washington, D.C. 20036.*

Illegal Kills Targeted

Turkey Federation Offers Reward

Turkey hunters in North Carolina are hoping the cash rewards they're offering will help restoration efforts underway for wild turkeys.

The N.C. State Chapter of the National Wild Turkey Federation and the N.C. Bowhunters Association together offer a $500 reward for information that leads to the arrest and conviction of anyone illegally killing a wild turkey.

"At one time, wild turkeys were abundant in North Carolina," said Charles W. Overton, president of the Eastern Piedmont Chapter. "In many areas, however, habitat destruction and poaching almost completely eliminated turkey populations."

North Carolina's wild turkey population has grown dramatically in recent years thanks to a successful restoration program. Wild turkeys are live-trapped and stocked in restoration areas by the Wildlife Commission with the support of the Wild Turkey Federation. These areas are closed to hunting until a healthy wild turkey population is established.

"We hope this rewards program will help control poaching," Overton said. "Many turkeys are killed because people are just ignorant of the law. Maybe these rewards will help get their attention, and create an interest among landowners and sportsmen. Poaching is a serious matter, and we want to intensify our efforts in controlling it."

Poaching and other wildlife violations can be reported to the Wildlife Commission's toll-free Wildlife Watch Hotline at 1-800-662-7137. All calls will be kept strictly confidential.

— *Angela Hill*

Try These Tips To Prevent Rust

Firearms Need Summer Care

The mild days of March turn a sportsman's mind to fishing. Before you put your favorite shotgun or rifle up for the season, however, take a few minutes to ensure that it will be in good shape for the next hunting season.

First, clean the bore with a powder solvent to prevent rust. A dry bore brush will aid in breaking loose stubborn residue. Then, alternately wipe the bore with wet and dry patches until no trace of stain remains.

Next, take a clean patch and evenly coat the inside of the barrel with gun grease. Clean the action and other surfaces and wipe them dry. Then, wipe them again with an oily rag followed by a dry rag. The thin coating of remaining oil will protect the firearm from corrosion. Before firing the gun, however, be sure to clean any grease from the chamber and barrel. This will prevent excess pressure from building up when you fire it.

Stored firearms should be wiped periodically with a light coating of oil. This is especially important if anyone has handled them because traces of sweat can cause rust. Be sure not to use too much oil, however, because it can seep into and rot gunstocks during storage. Many gun owners store their guns barrel down to prevent excess oil from seeping into the wood.

— *Lt. Ken Craft*

Focus On Conservation

New Film Celebrates Wildlife

Coming soon — a film depicting the destruction of a continent and the battle to save it. Titled *In Celebration of America's Wildlife*, the film was produced by the U.S. Fish and Wildlife Service and relates the situation facing wildlife at the turn of the century when it had been decimated by market hunting, overgrazing of range land, destructive timber cutting, and farming practices which left many areas eroded wastelands.

The film reveals how sound conservation practices restored our farmland, forests, and range land, and how wildlife species responded to the improvement of their habitat. The recovery of such species as the wild turkey, white-tailed deer, and pronghorn antelope is featured.

Loan copies of the film *In Celebration of America's Wildlife* are available from the Division of Conservation, N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27611. In addition, the film is also available in ½ inch VHS or Beta and ¾ inch video-cassette formats. These, and copies of a films list showing other available audio-visual programs, may be obtained from the same address.

Wildlife Officers Capture Fleeing Robber

The sign announcing the upcoming South Carolina State Line whisked past the car window quickly. But the driver, a young man in his 20s, saw it clearly. For him, crossing that line meant a chance at freedom. Stuffed in his pocket was what was left of the $80 he had stolen an hour before from a Henderson County motel.

It had been easy robbing the clerk at the motel. He'd hoped for more than $80, but had learned to take what he could. He was out on parole from an earlier conviction in California.

Soon after the robbery, he was speeding down Interstate 26 when something went wrong with his car. He pulled into a garage to get it fixed. With two sheriff's departments and the N.C. Highway Patrol sealing off the Interstate, he would have been caught within minutes of the crime if he hadn't stopped for repairs.

After the car was repaired, the robber paid the mechanic out of the stolen money and got back on the Interstate. He was speeding now, but the sign said the state line was only a few miles away, and he felt it was worth the risk. He knew the news of his robbery probably hadn't reached the South Carolina authorities. Crossing the state border seemed almost a guaranteed escape.

At about the same time, Sergeant Roger Lequire and Master Officer Rick Stone, two wildlife enforcement officers with the N.C. Wildlife Resources Commission, were also traveling down I-26. Officer Stone observed a 1978 light green Mustang closing fast in his rear view mirror.

"His speed is what caught my attention," said Stone. "And we recalled an earlier report of a fugitive fleeing from a robbery."

The robber must have recognized Officer Stone's Jeep Cherokee as belonging to a law enforcement officer because he quickly slowed down to the speed limit.

Sgt. Lequire got a good look at the driver. He fit the description they had of the robber. Without further hesitation, the officers "blue lighted" the Mustang.

"He pulled over and we read him his rights," said Stone. "The Polk County sheriff's department was notified and they took over."

The job description for wildlife enforcement officers lists such duties as enforcing hunting and fishing regulations, giving programs to civic groups and schools, investigating fish kills, making appearances on radio and television programs, and other miscellaneous duties.

"I guess apprehending a robber falls under miscellaneous duties," said Stone. "It wasn't really all that exciting. Just part of the job."

— *Jay Davies*

Calendar of Events

March 4-6
Dixie Deer Classic at the N.C. State Fairgrounds in Raleigh. Features trophy deer heads competition, displays of hunting equipment, and seminars on deer hunting and management.

March 15
Falls of the Neuse Chapter of Quail Unlimited annual fund-raising banquet at the Marriott Hotel in Raleigh. Proceeds go to quail management and research projects. For more information call Mike Grenther at 919-362-0583.

March 18-20
18th annual Unifour Gem and Mineral Show at the Country Adventures Convention Center in Hickory. Sponsored by the Catawba Valley Gem and Mineral Club.

March 25-26
Annual Convention of the N.C. Wildlife Federation at the North Raleigh Hilton Hotel in Raleigh. For more information contact the N.C. Wildlife Federation, 1024 Washington St., Raleigh, N.C. 27609.

Tar River Still Has A Few

Biologist Finds Endangered Mussels

The small mussel lying partially buried in the bottom of the Tar River might have been exactly like hundreds of others the scuba diver had examined in the past few days. This one was different, though. When he pulled it out of the mud he saw that it was a live Tar River spiny mussel — one of the rarest animals on earth.

"I surfaced and let out a big whoop," John Alderman recalled. Alderman is the Wildlife Commission's Piedmont nongame biologist, and spent much of last summer surveying the Tar River for spiny mussels with help from two biologists from the Raleigh office of the U.S. Fish and Wildlife Service. "It was fantastic. We found three other live Tar River spiny mussels in that same spot in Edgecombe County. We examined over 2,000 mussels, and only found these four. We surveyed 300 miles of the Tar River and its tributaries with scuba gear or snorkels, picking mussels out of the bottom."

More recently, Tar River spiny mussels have also been found in a small tributary of the Tar River. The news is encouraging because some biologists thought the species might already be extinct. Though this mussel was first discovered in the 1960s, no living specimens had been found for several years.

"The Tar River spiny mussel was probably never common," said Alderman. "Like many freshwater mussels, they need very clean water, and when they begin disappearing it's a good sign that we have water-quality problems. While reading early records, I found that as far back as 1812 people were talking about dredging sediment from the Tar River. There was a lot of siltation from farming even then. Over the past 10 years, spiny mussels have become extremely rare, but they may have been declining since colonial times."

Like other freshwater mussels, the Tar River spiny mussel has a complicated life cycle. Freshwater mussels are dependent upon a host fish for survival. The eggs of the mussels develop into larvae, and attach themselves to the gills or fins of a host fish. When conditions are right they drop to the bottom and develop into mature mussels which may live 30 years or more.

Siltation is one of the biggest enemies of freshwater mussels. Silt covers the mussel beds, clogging the gills of the mollusks and causing them to suffocate. Also, mussels feed by filtering tiny plants and animals from the water, and this concentrates toxic substances in their tissues.

The next step in the Tar River spiny mussel project will be to learn more about the mollusk's life history. The host fish will be determined, and the mussel's reproductive cycle and special needs will also be examined.

"We'll be investigating these questions over the next few years," said Alderman. "Our first priority is to identify and protect the Tar River spiny mussel populations that remain, and learn enough about them to assure their safety. Ultimately, we hope that the water quality of the Tar River will improve, and that this species can be restored to its original range."

The Tar River spiny mussel project is one of many activities supported by the Nongame and Endangered Wildlife Fund, which is funded largely through a checkoff on state income tax returns.

Boahn Named Officer Of Year

Master Officer Charles F. Boahn of Richlands was recently recognized as Wildlife Enforcement Officer of the Year for North Carolina at the Southeastern Association of Fish and Wildlife Agencies annual conference in Mobile, Alabama.

Boahn, a native of Washington, N.C., has been stationed in the Onslow County area of Wildlife District 2 since 1980. During that time he has made a significant number of night deer hunting and major wildlife violation arrests. He has also spent numerous hours on boating safety patrols and participated in search and rescue operations in the White Oak and New rivers and the coastal waters of the county.

ANGELA HILL

Good Work: *Wildlife Master Officer Charles Boahn (left) receives a plaque recognizing him as North Carolina Wildlife Officer of the Year for 1987. The presentation was made by District Captain Garland Hallman at the annual conference of the Southeastern Association of Fish and Wildlife Agencies in Mobile, Alabama.*

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Tracking North Carolina Boats A Big Job

Picture 242,387 boats — that's the number of valid registered boats in North Carolina as of November 31, 1987.

All the bookkeeping for these boats — their registration, and the overseeing of boat agents who process renewals of registration — is handled by the seven full-time employees of the Wildlife Commission's Boat Registration Section.

"In North Carolina, all boats using any type of motor — including electric motors — and sailboats over 14 feet at load waterline must be registered," said Helen Gournas, supervisor of the Boat Registration Section. "We have processed about 117,000 registrations as of last November. Boats may be registered for one or three years."

Boat registrations are usually processed in two weeks, although it may take three to four weeks in the spring or early summer.

"Everyone seems to wait for the first warm weather before they think about registering their boat," said Gournas. "This causes some problems for us. Although we hire some part-time help, we're still often swamped. Last June, for example, we processed 35,000 registrations."

One of the quickest ways for boaters to get out on the water is to renew their boat registration locally. New registrations, transfers and all other types of transactions, however, must still be handled through the Raleigh office.

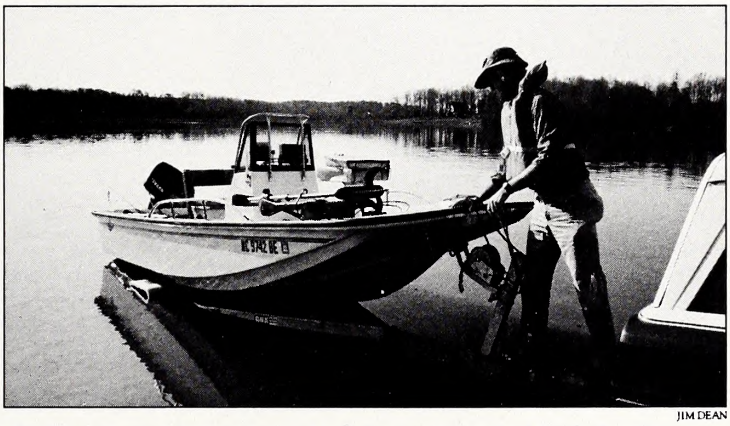
"We have 215 boat registration agents located throughout the state who handle renewal registrations," said Gournas. "Simply take your blue, three-part renewal card to these agents, and the renewal of your registration can be handled on the spot."

Gournas also offers the following tips for registering your boat.

— Return your registrations promptly. Don't lose valuable fishing time by waiting until spring or summer.

— Be sure your application is complete, and that the proper registration fee is enclosed.

— If you have any questions, consult your North Carolina Boat Owner's Guide (issued with registrations) or call the Boat Registration toll-free Hotline at 1-800-662-7350. This hotline is manned on weekdays from 8 a.m. through 5 p.m. Please have complete information and a pen and pencil ready when you call.



JIM DEAN

Small Army: *Over 240,000 boats are registered in North Carolina, and seven full-time employees of the Wildlife Commission's Boat Registration Section are responsible for keeping track of them.*

The Wildlife Endowment Fund Report

The Wildlife Endowment Fund is supported by the sale of lifetime licenses, lifetime subscriptions to *Wildlife in North Carolina*, and tax-deductible contributions. Only the annual interest from this fund is used for wildlife conservation, and the fund will play a key role in supporting wildlife programs in the future. Interest is earned through investments made by the State Treasurer's Office. For more information, write to the Wildlife Endowment Fund, N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27611.

Status on December 31, 1987

	Numbers Sold	Revenue Received
Lifetime Sportsman's License	44,080	$13,811,830.18
Lifetime Hunting License	307	69,333.81
Lifetime Fishing License	3,291	588,046.34
Lifetime Subscriptions to Wildlife in N.C.	1,254	157,899.53
Contributions	—	98,499.42
Fund Total		$13,982,729.40
Total Interest Earned	$2,427,884.86	

Good Reading

Restoring The Earth by John Berger. Published by Doubleday and Company, 245 Park Avenue, New York, New York 10167. $9.95. 215 pp., softcover.

Environmental issues are often presented in the dry jargon of scientists and government officials. Happily, this is not the case with John Berger's *Restoring The Earth*.

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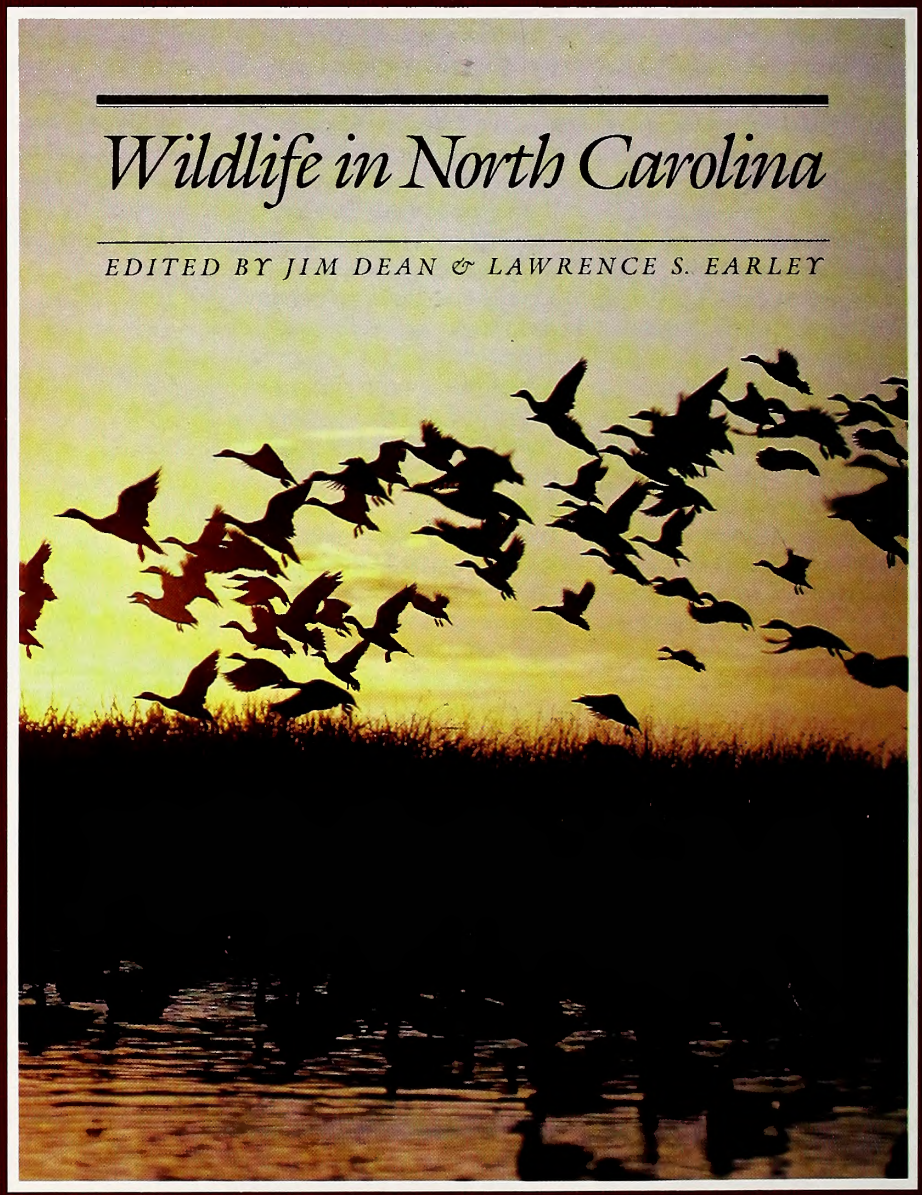

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Spring Sentinels

Four trout lilies appear above the forest floor at the roots of a beech tree. These wild flowers are among the first each year to test nature's renewed benevolence.

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WILDLIFE IN NORTH CAROLINA

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Somewhere Behind The Post Office

by Jim Dean

"Call some place paradise;
Kiss it good bye."
From "The Last Resort," by The Eagles

A fellow angler recently transplanted to western North Carolina has written to complain. "I love to fish for trout, but none of the local fishermen will direct me to the best spots," he lamented. "One fellow suggested I try the stream behind the post office, but he couldn't recall the name of it. Do you know of a stream around here that flows behind a post office?"

Indeed I do, I responded. I'm well acquainted with that stream, as well as a number of other phantom ponds, streams and lakes apparently located behind post offices around the globe. Every super fishing spot lies (lie being the operative word here) behind some post office. Anyone who gives you such directions will never be able to recall the name of the spot, or the exact distance from the back step of the postal facility to it — assuming of course, you began your journey from the right P.O.

JIM DEAN

Before you get riled at such a provincial attitude, it might be worthwhile to analyze the motivation. First, I should explain that my sentiments are with the close-mouthed mountaineers. On the surface, this reluctance seems selfish, but so what? It's also based on sad experience. After all, we may not know how many angels can dance on a pin, but it's not difficult to figure out how many anglers it takes to overcrowd a tiny stream.

With more and more people sharing our dwindling natural areas, the days are fast disappearing when a hunter or fisherman can pursue his sport in relative solitude, and if you find a spot you especially like, you're foolish to blab about it. We learn to protect our interests.

In the early 1970s, with the help of some maps and a lot of foot-weary hiking through a public area that had no trails, I located a fine stretch of remote brook trout water. For over a decade, I fished that water fairly regularly, and never encountered another angler. Then, one day in a moment of amiable weakness, I happened to mention it to someone. He began to fish there, and later took several friends. I stopped going when that wilderness creek began to attract more traffic than the Intracoastal Waterway.

I blame no one but myself, even though I realize some of that fishing pressure may have been entirely coincidental. It's not, however, a mistake I'll make again.

As noted, this isn't simply selfishness. You can make a pretty good case for secrecy on purely environmental grounds. Some years ago, when the N.C. Wildlife Resources Commission's wild turkey restoration efforts were beginning to pay off, a news article appeared just prior to the spring gobbler season. The gist of it was that a particular spot — not a very large one, either — was touted as the most likely place in the state to bag a gobbler. Of course, you know what happened. When opening day arrived, crowds flocked to the area, and nobody was glad to see anybody else.

Fortunately, turkeys are very wary creatures and the restoration effort suffered no setback. But the incident demonstrated at least the potential for publicity to pose a risk to wildlife resources in some small, fragile or sensitive areas.

Was the brook trout fishery hurt by the growing pressure in that tiny stream I fished? Hard to say. I didn't keep any of the fish I caught, but if a significant number of other anglers kept too many fish, the population could have been hurt. Brook trout are easy to catch, and there are instances where populations of these native trout have been virtually eliminated.

Not many years ago, it was routine for various agencies and publications to furnish highly detailed "where-to-go" information for sportsmen. Sometimes sportsmen were even told the exact spot to fish or hunt; which rock to stand on; which tree to hide behind. That kind of reporting, however, is increasingly rare, and that's almost surely a good thing.

Perhaps it's because more and more folks recognize the potential threat to resources from publicity. That's certainly one of the reasons this magazine has been careful over the years to avoid singling out or pinpointing small or fragile hunting and fishing spots that might not be able to handle the pressure.

It's also why many individual sportsmen keep their favorite spots "behind the post office." If a person is serious about his sport and takes the time to search out his own secret spots, he's far less likely to harm those resources. He's earned his solitude, and you can't blame him for clinging to it.

Sportsmen have always been secretive, and there are better reasons for it today than ever before. It's doubtful that Daniel Boone was keen on revealing his favorite deer-hunting spots in Kentucky even to acquaintances he knew would never cross Cumberland Gap. He was merely ahead of his time.

April, 1988
Volume 52, Number 4

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WILDLIFE IN NORTH CAROLINA

Wildlife in North Carolina is the official educational publication of the North Carolina Wildlife Resources Commission, and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources and the environment we share with them.

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Cover *A wild turkey gobbler in full display is an awesome sight, and a female turkey would no doubt find this stately gentleman very appealing. Photograph by Leonard Lee Rue III.*

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Spherical
Great horned owl

Elliptical
Common nighthawk

Cylindrical
Chimney swift

Short oval
Great crested flycatcher

Oval
Warbling vireo

Long oval
Red-tailed hawk

*Short pyriform**
Bobwhite quail

Pyriform
Upland sandpiper

Long pyriform
Common murre

(Egg shapes after Hal H. Harrison, *A Field Guide to Birds' Nests*. Houghton Mifflin Co., 1975.)

**Pear-shaped*

The Shape Of Spring

written by Lawrence S. Earley / illustrated by David Williams

Ever wonder why chicken eggs are mostly oval-shaped? So they'll fit in the egg carton? Actually, that's not as ludicrous as it sounds. Indeed, if ornithologists are to be believed, an egg's appearance — its color, shape and size — is as accidental as April showers and May flowers.

Among wild birds, egg shapes vary from the nearly round to the acutely pointed (see illustration). Of course eggs laid by the same hen exhibit slight differences, as do eggs laid by birds of the same species. But in general egg shapes are characteristic of different species. For example, round eggs are common to the owl, kingfisher and hooded merganser while the eggs of the curlew, plover and sandpiper taper from the broad end.

One reason for such differences is physiological. The shape of the bird's oviduct — the tube through which the egg passes on its way out — surely plays a role in molding the still-forming egg. But ornithologists generally think there's more to it than that. They hypothesize that egg shape is an adaptation that has a lot to do with the environmental conditions that the egg is hatched into, conditions such as the nest site.

For example, is it only coincidence that cliff nesters generally lay eggs with pointed ends? Ornithologists note that with such a shape, a rolling egg will turn in a tight circle around the narrow end, a capability that has an obvious survival value for cliff nesters. Owls lay round eggs, which roll in any direction, but since owls are hole nesters their eggs presumably are in no danger of going anywhere. During incubation, shorebirds arrange their eggs so that the pointed ends are down, an advantage to birds trying to incubate their large clutches.

Eggs vary in color as well, although most eggs are white or off-white. Coincidence? Ornithologists note that the reptiles, the ancestors of birds, also have white eggs and suggest that probably all primitive birds had white eggs.

But the eggs of many other birds are deeply tinted. In our area perhaps the most colorful eggs are laid by robins (light blue) and wood thrushes (deep blue, see last month's *Wildlife in North Carolina*, p. 24). Eggs also have a variety of markings — mottled, streaked, blotched and marbled. There seem to be good reasons for eggs to be the color they are. Birds that nest in (dark) holes generally have white eggs. Those that nest in trees often have bluish or greenish eggs, hues that blend into the leafy backgrounds. Then there are eggs that change color — the pied-billed grebe's freshly laid eggs are pale blue or green but turn buff or brown during incubation.

Eggs also differ in texture and thickness, sometimes astonishingly so. A hummingbird has a paper-thin shell while the *Aepyornis* — an ancient and extinct bird species — laid a three-gallon egg whose cavernous shell was 1/6 inch thick.

Of course, it's what's inside the egg that counts, what all these strategies of color, shape and texture have evolved to protect. That's why the egg is a perennially hopeful symbol and why it is so indelibly associated with the ancient holy day of Easter. Writer E.B. White expressed this powerful symbolism in a wartime April of long ago: "Though it seems untimely, I still publish my belief in the egg, the warm coal, and the necessity for pursuing whatever fire delights and sustains you."

Most birds lay *oval-shaped eggs, but here are several variations on the oval heme. The mallard chick has hatched rom a long-oval egg and other shapes ary from nearly round to pointed. Such hapes are generally characteristic of a pecies and seem to be appropriate to he nesting site.*

Egg Shapes and Colors

Species	Shape	Color
Pied-billed grebe	elliptical to oval	pale blue or green
Anhinga	oval to long-oval	pale bluish white
Cattle egret	oval	very pale blue
Least bittern	oval, elliptical or long-oval	pale bluish or greenish
Canada goose	oval to long-oval	creamy white
Mallard	long-oval	light gray or greenish buff or nearly white
Wood duck	oval	creamy white
Bald eagle	short oval to oval	dull white
Red-tailed hawk	oval or long-oval	dirty white
Bobwhite quail	short pyriform	dull or creamy white
American oystercatcher	oval to long-oval	buff or olive buff; brown splotches
Great horned owl	elliptical to nearly spherical	dull white
Flicker	oval to short oval	pure white
Crow	oval	bluish or grayish green
Mockingbird	oval	shades of blue and green
Prothonotary warbler	oval to short oval	creamy, brown blotches

GOBBLERS Don't Come Easy

The wild turkey has been more than an obsession for these three men, and what they reveal could help you get your gobbler this spring.

by Jim Casada

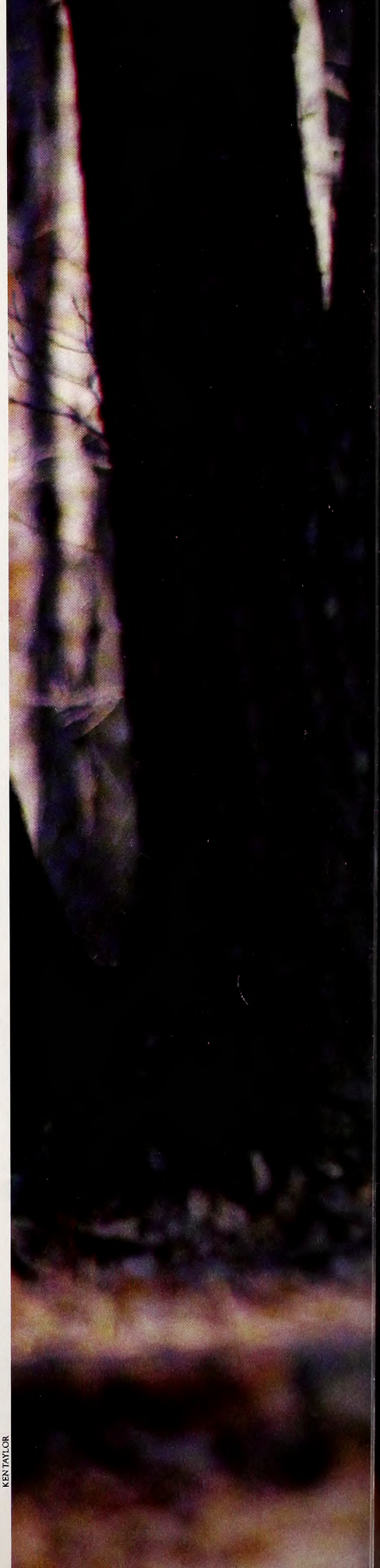
The difference between deer and turkeys is often summed up in an old anecdote: "When a deer sees a camouflaged hunter standing still in the woods, he thinks the man is a stump. When a turkey sees a stump, he thinks it is a man." The wisdom in this frequently quoted adage is undeniable, and there is no more accurate reflection of the wily, wary nature of turkeys. Many Tar Heel turkey hunters — and their numbers are increasing annually — believe that the state offers its sportsmen no more challenging, worthy quarry than a sage, seasoned old gobbler.

For all its savvy and uncanny instincts for self-preservation, there was a time in the all too recent past when the wild turkey was in real trouble not only in North Carolina but nationwide. Now, thanks to careful restocking, sensible hunting seasons, and concerted efforts to improve both habitat and population levels, things have changed. Indeed, Mike Seamster, the state's wild turkey project leader, says that populations of the bird are rising and should continue to do so for years to come. He says that the 1988 season, with good broods in 1987 and the ongoing population growth trend, has the potential to be the best yet. The turkey, as one student of the subject has written, is "riding hard on the comeback trail."

Of course there's a big difference between knowing the birds are there and carrying one home with you. Just remember that old adage about stumps and men. So how do spring-

KEN TAYLOR

Big, open forests *are the domain of the wild turkey, and this gobbler (right) signals his desire for a suitable mate with fanned tail and stately strut. Hunters call at twilight (above) to try to entice an answer that will reveal the location of a roosting gobbler, and a good spot to wait the following dawn.*



KEN TAYLOR

GOBBLERS Don't Come Easy

time turkey hunters improve their chances with the wiliest of game birds?

Three experts were generous with their advice on the subject. The first of them, Milton's Wayne Bailey, was at the center of the turkey turnaround in North Carolina. A one-time English teacher turned field biologist, Bailey headed the state's wild turkey-restoration project from 1970 to 1980. Today, in retirement, he remains devoted to everything associated with the bird that old Ben Franklin always felt should have been our national symbol. Bailey edits the state turkey newsletter, hunts at every opportunity, and as Gene Smith of the National Wild Turkey Federation commented to me, richly merits the title of "dean of North Carolina turkey hunters."

Another veteran of the Tar Heel turkey scene, Charlotte's Parker Whedon, killed his first gobbler four decades ago and still exudes energy and enthusiasm the envy of men half his age. A lawyer by profession, by inclination he is a turkey hunter of singular devotion. Parker collects memorabilia from the sport's rich past, and hunts at every chance. When I asked Larry Hearn, who calls himself Parker's "turkey hunting partner in crime," for some thoughts on Whedon's expertise, his laughing response was "How long have you got?" He went on to pay Whedon an even finer compliment by saying that "the man thinks more like a turkey than a turkey itself."

Between them, in short, Wayne Bailey and Parker Whedon represent almost a century of accumulated turkey-hunting wisdom, and they are remarkably similar in their depth of feeling for the hallowed traditions of the sport. Add to their expertise the insight of Rog Rodgers, a man who is developing a growing reputation as one of the South's top turkey guides (he also produces videotapes and makes calls), and the collective result is advice well worth heeding.

Parker Whedon offers a number of suggestions for locating turkeys once you know that there are birds in the general area. First, he reminds hunters of a basic but frequently overlooked fact. Namely, the birds have two distinct ranges — one in spring and summer and another in fall and winter. Other authorities comment that all too frequently beginners hunt where they have little chance of seeing turkeys. Just because you spied turkeys on hardwood ridges when you were deer hunting in the fall does not mean that they will be there in the spring. In spring, you will need to be near sources of water. Turkeys do not mind wet feet, so neither should you. Whedon says there are three keys to good spring habitat: (1) open areas such as fields, pastures, and clearings in the woods; (2) the availability of green grass or other early sprouting foodstuffs; and (3) proximity to branches, creeks, or some type of water.

TERRY SHANKLE

***This box call's** chalky rim reproduced the call that attracted this gobbler within range. Only gobblers are attracted to such calls during the spring season, leaving the mated females to raise the next generation.*

This means that hunters should concentrate their efforts around the edge of fields, in swamps or along waterways, or, ideally, in an area with a mixture of cover and good feeding areas. Such sites are surprisingly easy to locate, and endless hours of preseason scouting, productive as they may be in other ways, may not be vital on this score. With only a topographical or aerial map in hand, the prospective hunter can readily identify likely turkey habitat. It should be noted that many topo maps are considerably out of date as far as roads are concerned, but there is a simple way around this. *Hunting and Fishing Maps for North Carolina Game Lands* can be obtained free from your license agent, or by writing the N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27611. These maps, along with *North Carolina County Maps* (available from County Maps, Puetz Place, Lyndon Station, WI 53944 for $11.90), will show you most roads wider than a pig trail.

Once you have made a decision on the general area you plan to hunt — enthusiasts like to have several choice locations to visit in the course of the season — the easy part is behind you. Choosing the exact spot where you hope to lure a gobbler within shooting range requires some thought.

Rog Rodgers prefers "natural" blinds such as deadfalls, tree laps and the like, and Wayne Bailey emphasizes the importance of being properly placed before beginning to call. He talks of the turkey's "incredible sight" and incomparable peripheral vision (it covers something like 300 degrees at all times). For all practical purposes, given the fact that turkeys are constantly turning their heads, this means they have no blind spots.

Accordingly, it is highly unlikely you will stalk one successfully, inasmuch as it can hear, as well as see, much better than you. Thus it is of paramount importance to be situated where a turkey will be within shooting range when you are first able to see it. Otherwise, the chances are pretty good that something — it need be nothing more

***A well-camouflaged** turkey hunter sits motionless against a tree using a box call to try to attract a gobbler within range. Many hunters believe the wary gobbler is our most difficult and satisfying quarry.*

GOBBLERS Don't Come Easy

than the blink of an eye — will spook an approaching gobbler. Bailey says even when hunters are in a blind and supposedly completely hidden, turkeys frequently call on some sixth sense which warns them away from a danger zone.

Except for coincidence or pure luck, turkeys do not get within shooting range unless called. In fact, there is near universal agreement among long-time turkey hunters that a reasonable mastery of calling techniques is a vitally important key to success. Tom Turpin, who is perhaps the most renowned of all callers and call makers, makes this clear in *Hunting the Wild Turkey:* "The turkey has but few words in his vocabulary, but every word has a meaning and the expert hunter should know just what this meaning is. . . . To learn these different calls requires a good ear, a patient soul, and a lot of good honest work. An intelligible conversation with a turkey requires one of two things. The turkey must be able to speak English or the hunter must be able to speak the turkey language. Most of us have decided the turkey is not disposed to learn English, so about the only way out, is for the hunter to learn 'turkey.' "

Wayne Bailey recommends getting good instructional tapes on the subject and listening to them carefully. Also, attendance at the many turkey-calling contests held each year can help, although Rog Rodgers correctly cautions that this alone is no substitute for experience in the field. Another suggestion is to get around a flock of tame turkeys and listen carefully. Then practice until you get it right. There are various calls which eventually need to be mastered, but for spring hunting the most important one is the cluck the hen gives during the mating season. I like Parker Whedon's advice in this regard: "Get the gobbler's attention, then lay a heavy dose of silence on him."

The idea is to attract the attention of a romantically inclined gobbler, then hope that his hot-blooded mating curiosity will outweigh his instinctive wariness. Certainly one of the most common mistakes among beginners is calling too much. The more you call the greater the likelihood of a mistake, and one false note is all it will take.

It is always well to remember that during the height of the mating season, it's more natural for the hen to come to the gobbler, not vice versa. In attempting to reverse this pattern, you are going against the basic instincts of both sexes. Both Parker Whedon and Rog Rodgers feel that you have a better chance of getting serious attention from a gobbler after most of the hens have been bred toward the end of the season.

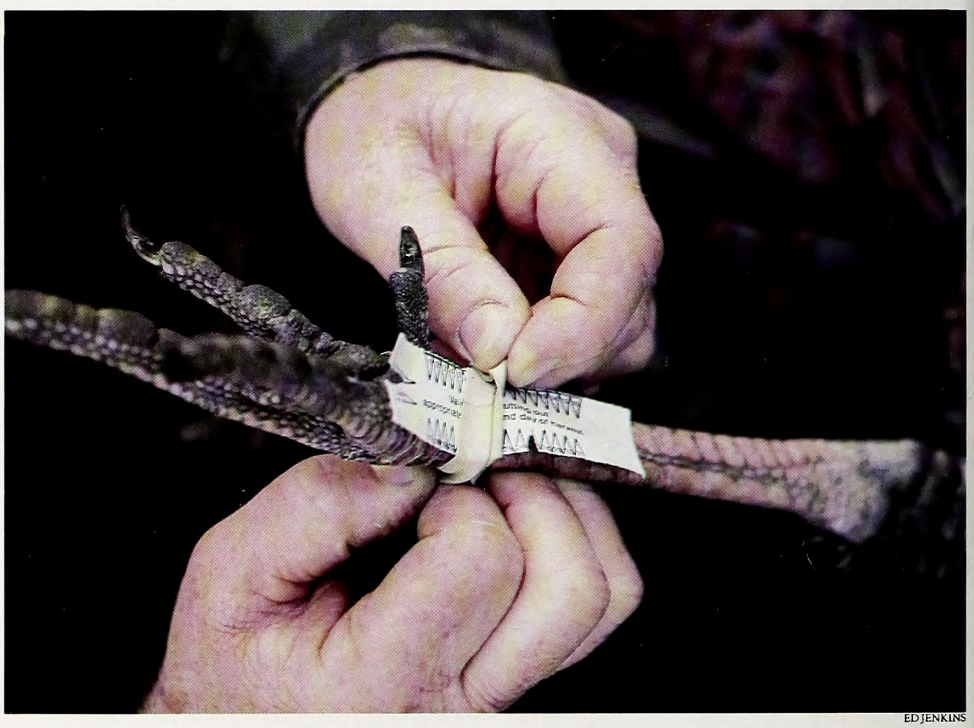
Parker Whedon has some sensible advice for dealing with reluctant gobblers which do not come to the call. If you hear one gobble and then hear him again a good bit farther away, Whedon suggests that the hunter should immediately and quietly cut the distance to the bird as much as possible. Then wait without moving until you hear the bird once more. This is the time to try a call to attract his attention once more, although this entire proceeding is fraught with risk. Birds are frequently spooked by rambunctious hunters getting too close. Whedon also says you can safely move toward a bird only when he has just gobbled. Still, this "trailing" technique, using sound, is better than letting a bird get away simply because caprice or a sexier sounding hen took him in another direction.

Another consideration frequently over-

Preparing To Hunt

In addition to the proper hunting license, those seeking a gobbler this spring are required to have a tag with which to mark your gobbler at the time of the kill. The 1988 season will run from April 9 through May 7, with a daily limit of one turkey and a season's limit of two birds. Only bearded birds may be killed. The 1987-88 *Regulations Digest* provides additional details, including information on which portions of the state are closed to hunting. In North Carolina, turkeys cannot be hunted with dogs, pistols, or rifles.

Certainly you should take some time patterning your shotgun prior to setting out to hunt. Neck shots are a must and you need to know the killing range of your shotgun in advance. Other essentials include a compass, waterproof matches, a knife, insect repellent, a small space blanket, some high-energy food, extra shotgun shells, and perhaps a carrying sling and rain gear. Most of these are obvious precautionary items which should accompany a hunter any time he enters the woods, no matter what his intended quarry.



ED JENKINS

***The wild turkey** gobbler is considered a big game animal in North Carolina. All kills must be tagged and reported as part of the Wildlife Commission's successful turkey-restoration program.*

***A successful season** is often measured by a single kill that follows months — perhaps years — of scouting and sharpening of skills. This proud hunter would tell you the payoff is worth the time.*

looked by hunters is the weather. Rodgers prefers a cool, clear, crisp morning with little or no wind, but he rightly points out that a hunter may not get such optimum conditions more than three or four times a season. Accordingly, a knowledge of what turkeys do under varying conditions is essential. On rainy days, for example, gobblers are likely to stay on the roost longer. Like courting human beings, gobblers want to look their best, and this requires more preening in damp weather. Mid-day is a good time to hunt when it is raining. In windy weather, turkeys like to be out in the open. This may seem strange, but it is explained by the fact that under such conditions they cannot rely on their keen hearing, and being in the open gives their incomparable vision full scope.

While there is no doubt that getting settled in a good spot before dawn is basic, spring turkey hunting can be an all-day proposition. In fact, most serious hunters will tell you that they kill as many gobblers in the afternoon as they do shortly after the birds leave the roost in the morning. That should be good news for most hunters, for it means that anyone living fairly close to good gobbler territory has the opportunity for an hour or two of late afternoon hunting after work.

The foregoing tips, drawn from the hard-earned knowledge of men who unquestionably hold graduate degrees in the school of turkey training, should be of help to those approaching the 1988 season. One other suggestion stressed by both Parker Whedon and Wayne Bailey is that anyone who is serious about his turkey hunting should read everything he can get his hands on. This will enhance the hunter's understanding, not to mention his appreciation, of the glories of the sport. He will, to be sure, encounter conflicting theories and advice from time to time, but the partnership of knowledge garnered in the reading room armchair and that acquired in the woods will eventually pay off.

Both Whedon and Bailey subscribe to the theory that when you stop learning, you should stop hunting. Or, as Horace Kephart, another North Carolinian, eloquently wrote: "There is no graduation day in the school of the woods." After a century of hunting between them, Bailey, Whedon and Rodgers are still happily in school, even if it is graduate school. ⊠

Big Bird Is Back!

Wild turkeys were nearly eliminated from North Carolina's forests at the turn of the century, but thanks to biologists and sportsmen, these magnificent gamebirds are making an impressive comeback.

LEONARD LEE RUE III

***You might call** this a caucus of turkeys, but it's really just a group of young gobblers. The restoration of wild turkeys to many parts of North Carolina has been very successful, and the population continues to climb.*

by Mike Seamster

A million bright stars shined overhead as the camo-clad hunter quietly eased down the spine of the ridge in the pre-dawn darkness. It was going to be a crisp, clear April morning, perfect for spring gobbler hunting. The hunter had no trouble finding his way in the darkness for he knew this ridge well. For the past three mornings he had played cat-and-mouse with a big gobbler in this block of woods, and only the night before he had roosted the big bird on a piney point at the end of this ridge. Maybe this morning things would turn out different.

As he eased into final position about 100 yards from the bird, he cupped his hands to his mouth and hooted like an owl. The big gobbler responded with a deep, throaty gobble right where he was supposed to be. The hunter sat with his back to a thick-trunked pine tree and waited. As the eastern horizon began turning a beautiful pink, he slipped his diaphragm turkey call into his mouth and emitted a soft yelp. The gobbler sounded off again. With each passing minute objects began to take shape in the gathering daylight. Dogwoods were in full bloom and the woods were alive with color. The hunter rapidly beat his cap against his leg to simulate a hen turkey flying down, followed by an excited cackle from his diaphragm call. The gobbler immediately answered with a double gobble and within seconds flew down from its roost. The hunter eased his gun up across his knees and waited, not wanting to call too often.

Five minutes passed, then 10. Just as he was about to call again, he caught a movement out of the corner of his eye over his right shoulder. The hunter slowly turned his head. A sharp alarm putt told him he had been caught. The hunter quickly swung his gun in that direction but was too late. Chalk up another victory for the turkey. As the hunter headed back to his truck, he still felt thankful for the opportunity to hunt our largest game bird. Just a few short years ago, his section of the state had no wild turkeys. The Wildlife Resources Commission's wild turkey restoration program established this population of birds, as well as many others like it.

When the first settlers came to this country, the wild turkey was abundant. As the country was settled, however, extensive logging eliminated much of the original forest habitat and uncontrolled, year-round

hunting took its toll on turkey numbers. By the early 1900s, the wild turkey had been eliminated from large sections of North Carolina. Although restoration efforts began as early as the 1940s and a fall season was eventually established for the bird, the decline continued through the 1960s.

Early attempts at restoration involved releases of pen-reared birds in some cases. Not only were these attempts unsuccessful but they were detrimental to the remaining wild birds. Pen-reared birds are carriers of diseases to which wild birds have little or no resistance. If domestic birds do survive long enough to breed with wild birds and carry no diseases, genetic pollution occurs. The resulting offspring are genetically inferior to the wild birds and are not as well suited to survive the rigors of the wild. It is now illegal to release pen-reared birds or to allow them to roam freely.

The only effective way to establish populations of wild turkeys is through the capture and relocation of wild birds. Initial attempts at capturing wild birds involved the use of crude chicken-wire traps and were largely unsuccessful at moving sufficient numbers of birds. It wasn't until the advent of the cannon net that significant progress was made. Today, even more sophisticated rocket net systems and tranquilizing drugs are used to capture the birds.

By 1970, the state's turkey population had dwindled to fewer than 5,000 birds. Although an unpopular move at the time, a moratorium was placed on fall turkey hunting in 1972 and a spring gobblers-only season was established. The season is set when most of the hens have already been bred and the gobblers are no longer considered a vital entity to the productivity of the population. Restoration efforts were intensified and the wild turkey began its comeback.

Tagging and reporting of big game became mandatory during the 1976-77 season and the reported harvest for the 1977 spring season was 144 birds. By 1980, the estimated population of wild turkeys in North Carolina had climbed to 8,000 birds and the reported harvest was 316 birds. Since 1970, just over 1,000 birds have been live-trapped and relocated to some 50 different restoration areas across the state. Today, the state boasts over 15,000 birds and the reported harvest for the 1987 spring season was a record 679 birds. Over two-thirds of the state's 100 counties now have populations of wild turkeys. The primary areas of occupation are the Camp Lejeune Marine Corps base and the Roanoke River basin in the Coastal Plain, about 10 counties in the Piedmont Region, the mountains and foothills of the Northern Region, and the national forest lands in the Western Region.

LEONARD LEE RUE III

These hatchling turkeys *have a better chance of becoming adults because their parents have not interbred with domestic turkeys, thus losing instincts critical to survival. North Carolina's restoration efforts rely only on wild turkeys.*

CURTIS WOOTEN

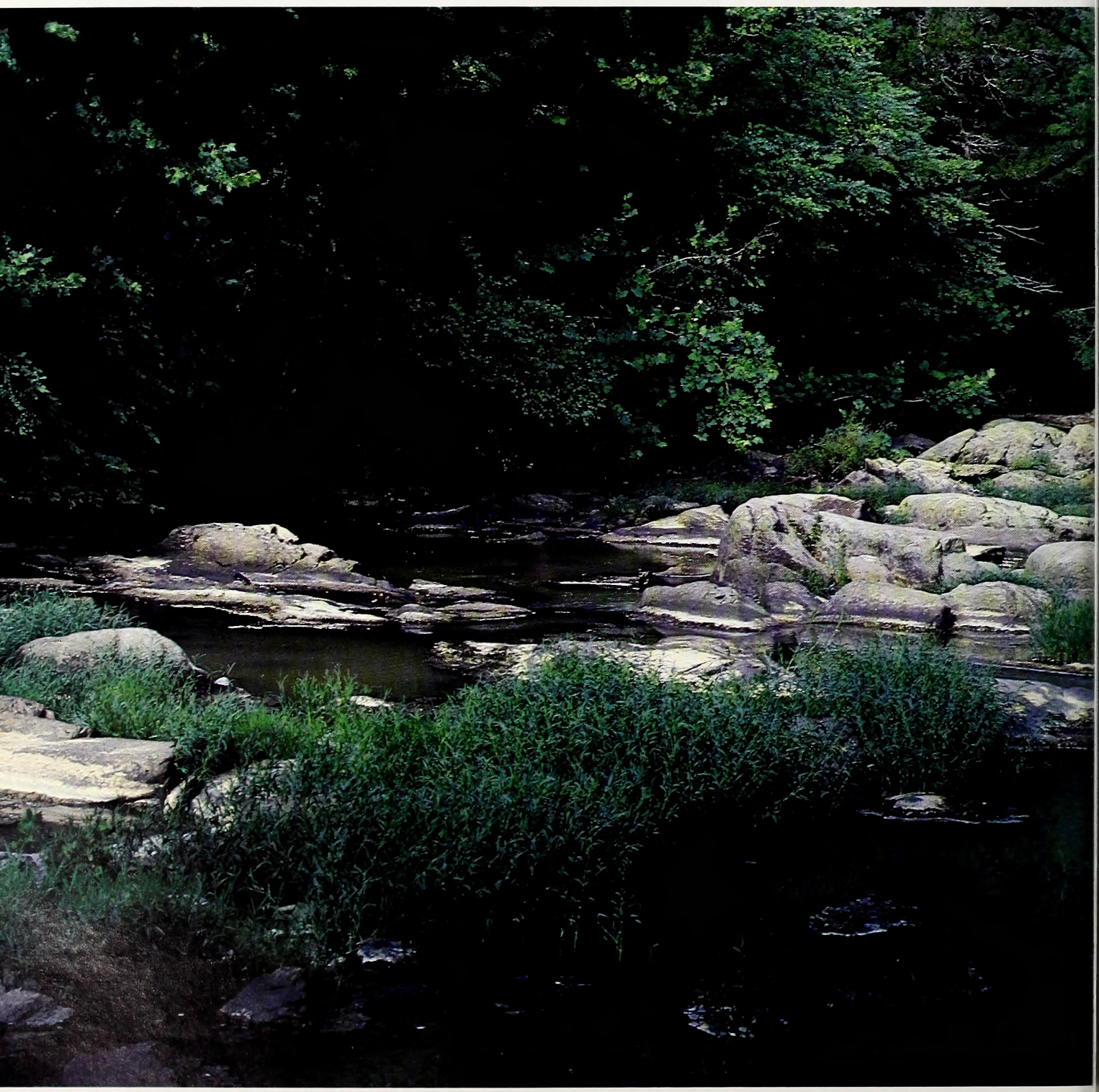
This wild turkey *was live-trapped from an area that already had a well-established population of wild turkeys. By releasing it and other wild turkeys in an area that has good habitat, but no turkeys, a breeding population can frequently be established.*

Successful restoration projects have resulted in increased populations and harvests in the Coastal Region in recent years. For the short term, this trend is expected to continue. However, large scale draining and clearing operations will continue to eliminate much of the habitat in this region. The Piedmont Region offers the best quality habitat in the state and turkey numbers have shown improvement in recent years. This area also has shown rapid urban and industrial development. Habitat loss will continue to be the main problem facing the wild turkey in the Piedmont. The mountains, with vast acreages of national forest lands and private lands offering good habitat, provide the greatest opportunity for the wild turkey in North Carolina in the future. Significant improvements in both population levels and harvests have occurred in recent years. The greatest obstacle in the western mountains is the lack of adequate brood range.

The Wild Turkey Federation has also made important contributions to the restoration of wild turkey in North Carolina. The Federation, as a national organization, as a state organization, and as many local chapters, has contributed time, money, and manpower to habitat-improvement projects, research projects, and restoration activities across the state. The Federation also offers a $400 reward (an additional $100 is offered by the N.C. Bowhunters Association) for information leading to the arrest and conviction of anyone illegally killing a wild turkey. The most significant impact the Wild Turkey Federation has had is in increasing public awareness of the needs of the wild turkey.

Although much progress has been made during the past 15 years, wild turkey restoration is far from complete. Over 2 million acres of unoccupied wild turkey habitat has been identified. Clearly, restoration will remain the primary objective of the wild turkey project for many more years. ⊠

Before The Bulldozers



Why not catalog valuable natural and historic sites before development threatens them? That's what Durham County environmentalists and developers did in this highly successful, cooperative program.

By Lawrence S. Earley

The scenario is all too familiar. A transportation engineer in a sizable, growing Piedmont town routes a badly needed road through a forest. Just about the time the bulldozers go to work, however, conservationists and historic preservationists raise a hue and cry, pointing out that the woods contain a valuable oak grove that was part of an old plantation. It's an important natural area, they maintain, as well as being historic, and it ought to be preserved. The city has already put in hundreds of hours on the project and now it faces a costly revision.

Here's another scenario. Before he assigns a route to the new road, the engineer consults a map where the county's important natural and historic sites are plotted. Noticing that the projected road runs through the oak grove, he adjusts the route so that the road avoids the natural area.

It only takes a glance at your community newspaper to know that the second scenario is about as rare in North Carolina as snow in August. And yet it doesn't have to be that way.

That's what a small group of Durham County residents proposed in late 1984. Faced with several development projects that were causing community divisiveness and confrontation, the group asked: Why not find and catalog the county's natural and historical sites *before* the bulldozers arrive? Once identified, these sites could be considered during the planning stages of new development projects. That's how the Durham County Inventory of Natural and Cultural Resources was begun.

Since its inception, the Inventory has proved to be a rallying point for county citizens interested in their environment. It has brought together people from all ranks to talk about what makes Durham special, and it has helped defuse the emotions that normally accompany discussions of growth and conservation.

The Little River *cuts a scenic path through Durham County, one of several rivers and their bottomlands listed on the Durham County Inventory of Natural and Cultural Resources.*

Best of all, it is proving to be a model of community planning well worth imitating by other counties in the state.

"We did several clever things right from the beginning," says Hildegard Ryals, chairperson of the Inventory. "First, we had a wide-based group that included developers as well as conservationists. From the very beginning we tried to include just about every faction in Durham. We figured we needed a name that would bring in broad-based support, so we called it the Inventory of Natural and Cultural Resources. And we tried to be nonconfrontational."

With a steering committee that included a prominent realtor, elected officials and representatives of community organizations, the group launched a multi-phase study of the county. In Phase One, students from the Planning Department at the University of North Carolina at Chapel Hill, supervised by the Triangle J Council of Governments, studied existing documents and drew up a computerized list of natural and historic sites within the county. Simultaneously, a Duke student was plotting these sites on maps and also indicating the soils, slopes, wetlands and other natural features of the county.

As these efforts continued, other volunteers tried to involve the entire community in identifying sites for the Inventory.

"We did a slide show and showed it all over the community," says Mrs. Ryals. "We held a photography contest and got people to photograph their favorite things. We developed a questionnaire so that people could identify places they thought ought to be on the Inventory. It wasn't so much to discover new things, as to raise the consciousness of the community."

Meanwhile, funding had been secured for Phase Two of the Inventory. The Triangle Land Conservancy received $7,000 from the Historic Preservation Society of Durham County to hire consultant Jane Sheffield to do a survey of the county's historic structures. The Conservancy also provided another $7,000 for Rob Sutter, a botanist with the state's Plant Conservation Program, to survey the natural areas of the county.

Sheffield's survey turned up more than 150 sites of historic significance. She documented both the well-known historical monuments such as Duke Homestead and the more obscure places such as old cemeteries, farmhouses, mills and archaeological sites.

Sutter began his natural-areas survey in early 1986 and completed it the following fall, identifying 52 sites of national, regional, state and county importance. Dick Rettig, who compiled a companion survey of wildlife species in the county, found 30 mammal species, 216 birds, 57 reptiles and amphibians and 54 species of freshwater fish. Sutter was stunned at some of the natural habitats he found.

"I was really surprised at how beautiful the Flat River was north of Lake Michie," he says, "and at how significant some of the vegetation was. The Eno River has more significant plant species, but the Flat is just a spectacular river and it's very under-used in terms of recreation and hiking." Other personal favorites were the old-growth bottomland hardwood forests along New Hope Creek and the Eno River.

Sutter says that Durham County is one of the most unique counties in the Piedmont in terms of its rare flowers and its natural areas. One reason is the presence of diabase upland areas which occur in the northeastern part of the county. In these places a rare volcanic rock produces a soil that supports an assemblage of plants more common in the prairie region of the United States — species such as the smooth coneflower *(Echinacea laevigata)*, the blue wild indigo *(Baptisia australis)* and the prairie dock *(Silphium terebinthinaceum)*.

Two other reasons for Durham's uniqueness are results of the Triassic Basin, a geological area of lower elevation consisting of softer, sedimentary rocks.

"Some of the largest floodplains in the Piedmont occur in the county," says Sutter, "resulting in some of the largest floodplain forests in the Piedmont. That's because when the rivers come down from the Slate Belt into the Triassic Basin, they cut down in the softer sediments, causing the rivers to meander." These meanders create wide

GEORGE PYNE

flood plains along New Hope Creek and both the Eno and the Flat rivers.

The lower elevations of the Triassic Basin also cause the rivers to cut deep paths through the Slate Belt as they approach the Basin. As a result, several of the rivers have steep north-facing slopes where plant species more at home in the mountains have found a little niche.

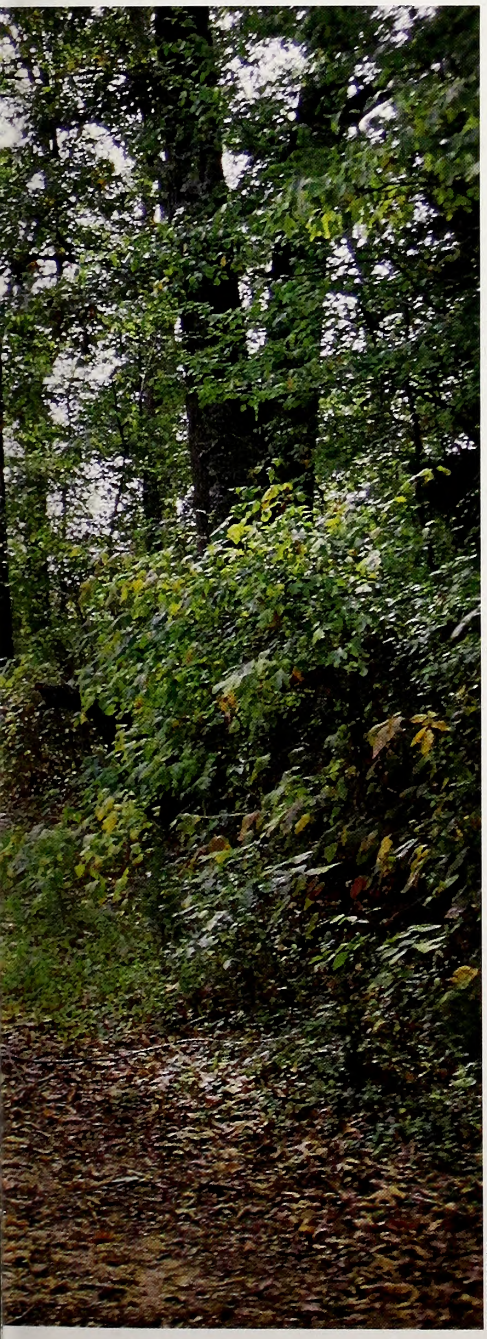
"If you look at plant distribution maps," Sutter says, "there are a lot of species that occur in the mountains and also in Durham, Chatham and Wake counties but not anywhere else in the Piedmont. That's because of those north-facing slopes. The yellow lady slipper *(Cypripedium calceolus)* occurs primarily in the mountains and in Durham County. Rhododendron *(Rhododendron catawbiense)* occurs only in the mountains and a couple of other places including Orange and Durham counties."

Sutter says he received valuable information from amateur naturalists in the county who knew areas unknown to professional botanists. "A lot of these naturalists were people who knew plants and could talk about

***Both natural and** historic resources have been identified throughout Durham County. Above, the dainty Carolina thistle is one of several rare flowers growing in the county. Remnants of the Indian Trading Path (below), an important southwest-northeast route in John Lawson's day, are also on the Inventory.*

them using scientific names. But they also included people who may have not known the scientific names but knew the common names and knew that the plants were special. They may have hiked only over 20 acres of the county, but they knew it well."

The value of the Durham County Inventory of Natural and Cultural Resources is considerable. "Durham County has plenty of land to accommodate future growth without destroying those links with the past that are so important to so many people," says Raymond Green, senior planner with the Triangle J Council of Governments. "I think the value of the study is that it alerts everybody — development interests, property owners, planning officials as well as all those interested in the quality of life — to the location of these places so that development will avoid them."



DUNCAN HERON

To Rob Sutter, the Inventory has another important use. "The information in the Inventory allows us in Durham County to be active not reactive," he says. "The cards are on the table before development begins. People now know what's important in Durham County."

Meanwhile, the Durham Inventory goes on. Phase Three was completed in 1987 and Phase Four continues. Phase Three consisted of a consultant's report on how the county could implement the twin natural and cultural resource surveys. Phase Four consists of attempts to implement some of the consultant's recommendations.

"The positive results of the Inventory are just astonishing," Mrs. Ryals says. "First of all, it's a name and it gets into all sorts of things. Last spring we managed to get an item in the City bond issue for open space acquisition. It wasn't much, but it's $400,000 that wouldn't have been there otherwise. She cites $1.5 million in a county bond issue for open space acquisition as well. "The Inventory has stimulated not only environmental consciousness throughout the county, but money and ordinances," she says.

One of the windfalls of the Inventory has been the willingness of people who usually talk *at* each other to talk *with* each other. Says Mrs. Ryals, "As long as we're talking, we're not fighting quite as much." ⊠

GEORGE PYNE

The blue wild indigo (Baptisa australis) *is a wildflower more common to the prairie regions of the United States. Durham County has one of the state's largest outcroppings of diabase rock which weathers to form a soil hospitable to these rare plants.*

Planning A Natural Areas Inventory

No other county has executed a survey of its important natural and historic sites as impressive as Durham's. Several other counties have natural-areas surveys underway — among them Gates, Orange, Buncombe and several coastal counties — but only a few have been completely surveyed.

Fortunately there is help for counties that need guidance in planning and executing a survey. The N.C. Natural Heritage Program is responsible for inventorying and protecting important natural areas statewide. According to director Chuck Roe, the Heritage Program has conducted surveys for several North Carolina counties. Heritage Program staff either conduct the surveys themselves or supervise work by contract scientists. The program assures that the final report meets all expectations.

There are many sources of funding for these inventories. Roe says that local county and municipal governments have financed some projects, while special state appropriations and federal grants have funded others. For example, surveys in Buncombe and Moore counties were funded by appropriations by the N.C. General Assembly. Most surveys can be completed for a total costs of $13,000 or less.

For more information about natural-areas surveys, write:

N.C. Natural Heritage Program
Division of Parks and Recreation
N.C. Department of Natural Resources and Community Development
P.O. Box 27687
Raleigh, N.C. 27611
(919) 733-7701

For information about the Durham County inventory, write:

Hildegard Ryals
P.O. Box 51364
Durham, N.C. 27707
(919) 489-5897

April Showers

The gentle rains of spring replenish ground water, nurture a seasonal burst of green, and reveal a special beauty for those who look closely.

photography by Kerry Givens

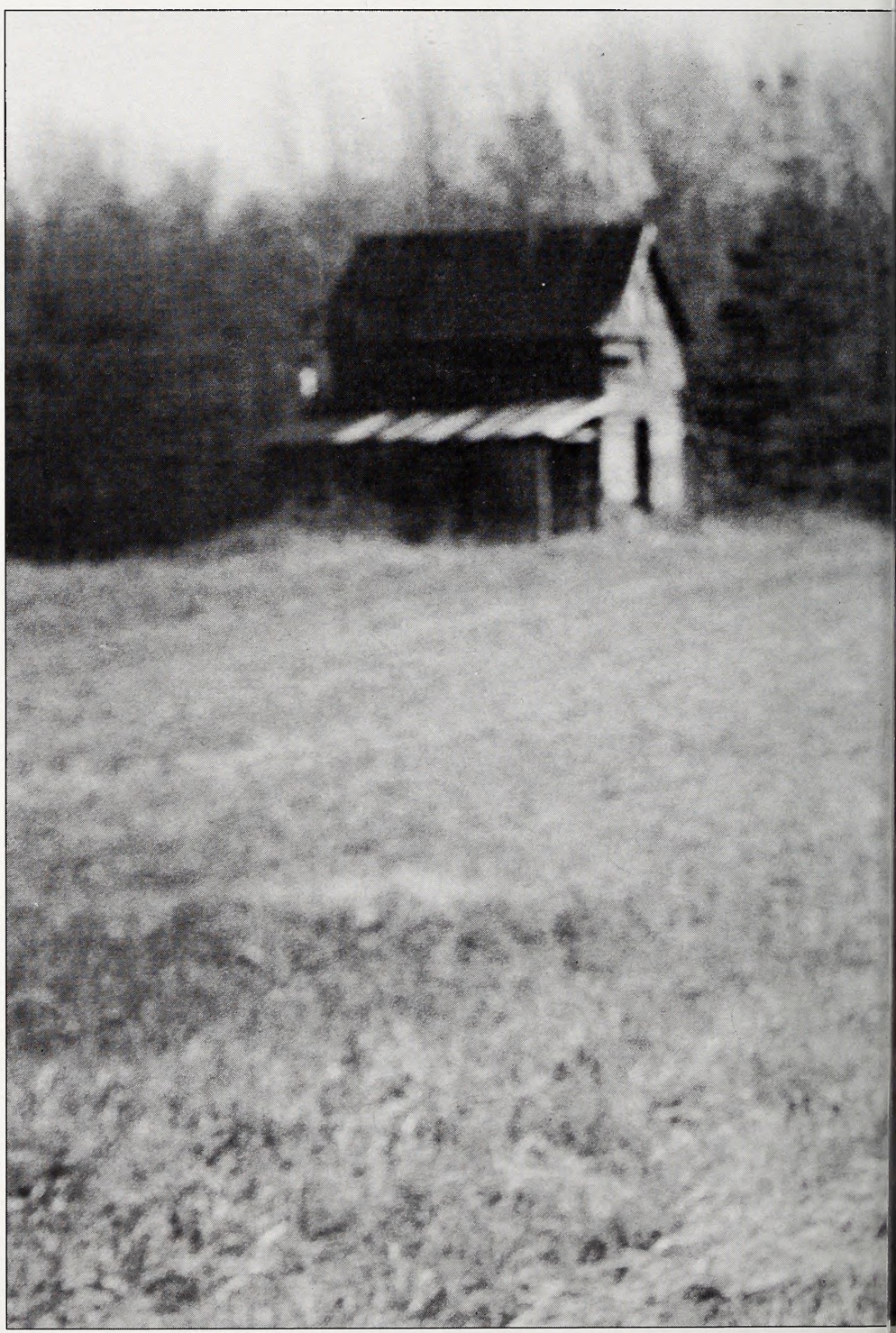
"It don't pay to get too confident," the farmer says, standing in his field under a sullen sky. "We owe our very lives to two things that ain't always in terribly good supply — several inches of topsoil and the fact that it rains."

This April day, as we stand ankle deep in a muddy field, it might seem as though it's been raining forever. The farmer isn't fooled, however. He can still taste last year's dust from endless days when his crops baked under hot, blue skies. His livelihood; our sustenance.

We stoop in the grassy edge of the field to look at a fresh green sprout wearing a row of droplets. One drop has captured the image of a nearby dandelion, a perfect reflection, a perfect symbol. What nourishes this common weed nourishes all life. This bud's for you.

My Life With The Dogs

Bay Nowell has trained over 1,300 setters and pointers for bird hunters and field trial enthusiasts. As a way of life, it's had its moments.



interview by
Lawrence S. Earley and
A. Sidney Baynes

Take the back roads of North Carolina's bustling Piedmont and you can still detect the rural fabric of the state. Here are the long, sloping fields, the green hedgerows, the patches of woods and the creek bottoms. One hundred years ago, it was the kind of landscape that was beginning to draw Wall Street tycoons in private railroad cars to the state, all for the sake of the bobwhite quail which flourished in the habitat created by small farms.

But quail hunting wasn't just a rich man's sport. Farmers throughout the Piedmont also took to the fields in winter to enjoy covey rises that rivaled those of the big lodges in Guilford and Randolph counties.

One of those small farmers was Bay Nowell, "an average poor man," as he calls himself, who grew up near Wendell, a small farming community due east of Raleigh. Like most of his neighbors, he hunted early, mostly pursuing the rabbits then plentiful. But soon he turned to bird hunting and developed a special skill training bird dogs. In 1962 he began to train bird dogs professionally and in the following 18 years he trained nearly 1,400 dogs.

Like all bird dog owners, Nowell employs a special vocabulary to talk about the dogs that he has known. He refers to "broke dogs" and "outlaws," dogs that "blink" and dogs that "bolt," "flagging dogs" and dogs that "run their sugar out." He claims to be able to detect nuances of quality in the color of a dog's coat or in the shape of its nose.

Nowell says that each dog presented a different problem to him when he was training dogs. "Dogs have different personalities," he says, "and you got to learn to outsmart those dogs." Sometimes it wasn't the dog that needed

LAWRENCE S. EARLEY

On the site *of his former dog kennels, Bay Nowell recollects days when he had 24 dogs in his pens. Behind him are the remains of his stables where he quartered horses used in training field-trial dogs.*

the training. "A lot of dogs have more sense than their owners," he says.

Wildlife in North Carolina *visited Bay Nowell in Wendell not long ago and asked him to share his reminiscences about his life as a dog trainer. He talked about the dogs that he has owned and trained, but he also shared his thoughts on that most aristocratic of game birds and the changing habitat that has made the bird less common today.*

I was born in 1915 on my father's farm about two miles south of Wendell. My father raised tobacco, corn and some cotton. I remember when I was growing up, we always had hogs and chickens in the yard, and cows. We grew all our vegetables. The only time you'd come to the grocery store would be on Saturday. You'd catch a chicken out of the yard or bring some eggs or butter and trade them for sugar or something that you could use. We hardly ever bought anything from town.

It was just a little 40-acre farm, and about half of it was open territory. My father was a hard-working man. Farming is a hard, tough life. The land was broke with a mule then. We never did have a tractor. Get out there in the morning by the time it gets light walking in a narrow furrow all day long. If it don't make you want to join the Army or something to get away from it, you got to be a tough man. I said, when I get grown I ain't going to be no farmer. But I was a farmer for a long time.

Back then the population was so thin, you were glad to see a man come across your farm — so you could get a "Hello there!" And we communicated sometimes by hollering. James Rabon over yonder or Ed Todd over here, they'd holler and you'd holler back. You'd recognize each other by your holler.

My mother died when I was three years old. And my uncle came to my house and lived with us when I was just a little bitty fellow. I can remember just as good as if it were yesterday my uncle going down a little dirt path, going hunting with a dog named Leader. I remember that dog would jump on a snake and tear him all to pieces. My uncle would let me go so far, and then he'd say, "Now son, you better go on back to the house." I wanted to go with him so bad.

My daddy would never let me have but one dog that would run a rabbit. Times were tight back then. Daddy couldn't afford to feed it. So we'd bake cornbread, feed the dog pot likker, let it eat a lot of cabbage and stuff like that. The dog would suck a few eggs, you know. But that was my first love for hunting. A fellow named Will Crawford was possum hunting nearby and I would possum hunt with him.

I went to beagles in 1939. When I was rabbit hunting, we used to go around and kill maybe 20 or 30 rabbits a day. We'd have big rabbit barbecues. First day in January back

***One of Nowell's** favorite dogs was Palamonum's Bo, which he trained to become a champion. Bo had great style and polish, but when Nowell first saw him he lay down on his point. "They gave me a steak dinner for breaking that dog," Nowell says.*

in the forties, we'd meet the other side of Lake Myra here and run down rabbits with sticks. Not carry a gun at all. We'd run this pack of dogs for awhile and that pack of dogs.

I got married when I was 25 and left home. But I continued with my beagles until about 1947. I kind of wanted to bird hunt some. One day I went with my wife's uncle and I killed 12 birds one day. That's what set me afire, you know. That was the first time I had been bird hunting.

My father in law was a bird hunter and I just got into it. I saw this little dog — a setter — sitting up in a man's yard just like a little monkey. I said, "George, I got a beagle I'd like to trade for that bird dog." He said all right. And that was Don.

Don was the first bird dog I ever had and he was the best dog I ever had. He was close ranging and he had an excellent nose and if he run across a covey of birds and he smelled it one bit, he would get down and stick his nose down, he'd walk along there and sniff, he'd raise his head up, he'd have his tail going like that. You give him time, he'd walk that trail and find them birds and point 'em and never run off a bird. I ain't saying he never run off a bird in his life, but I'm talking about after he got broke of it. If he run off a bird, it was unintentional.

We were over here at Miz Anderson's house and that dog went on down the bottom and he didn't come back. I said, where in the world has ol' Don gone. After awhile he come easing out of the bottom and he stood there and looked at me just wagging his tail. I went on down. He didn't ever move. But when I got right on him, I said "Go ahead, Don" and that dog turned around and started cat-walking, went across the branch over yonder, went down the branch a little bit to a log and pointed again. He did that about 20 times in his life — he'd find the quail and come back to get you or come back where you could see him, and he'd take you right back to the quail. He lived 12 years. He died of cancer.

He was the greatest dog I've ever known and the ugliest dog I've ever seen. He used to be afraid of a gun when I first started. That dog would point a covey of birds and turn around and go back yonder and sit down, behind me. I'd get up, flush the bird and shoot. He'd get to moving around again and hunt just as pretty as you ever saw until he smelled game, and then he'd go back and sit down. And I said, "Well you ain't going to be no good."

Until one time when he come between me and a covey of birds. He was right in the covey when he pointed and the birds flew. I killed one, he saw it fall and he went and got it. He was broke from then on.

It could work for you that way sometimes. It's done and you don't know how in the world it happened. That's the way bird dog training is. Somebody asks, "What in the world did you do to that dog?" You can't remember. You got to try this, that and the other. It's like getting a spot out of your clothes. You put this detergent on it, that one on it, and maybe it's cleaned but you don't know which one done the job.

I worked for Hudson Belk in Raleigh for 13 or 15 years. And then in the early sixties I was given a leave of absence for about three months. During that time I sold a dog for $850. One bird dog. And I said I believe I'll get a friend of mine and we'll build a kennel. I had a building 100 feet long with 24 pens, 8 feet by 16 feet, with pens on each side of the kennel. And I trained dogs professionally from 1962 to 1980 when I retired. I got out my old ledger book the other night. I think it was about 1,300 to 1,400 dogs that I worked. Some of them weren't trainable, but I worked every one of them. I've trained 'em in Alabama, all over North Carolina, South Carolina and New Jersey.

I trained mostly gun dogs — we also call them foot dogs — more than I ever trained field trial dogs. They're two completely different dogs. Your gun dog is a dog that stays close to you. It'll point the birds and bring them back after you shoot them. You hunt with it. You want a dog that you whistle at him to turn and come to you and stay with you. He'll make you a good dog if he's got any bird sense. You don't want what we call outlaws. That's a dog that runs all over the country. I've seen 'em run for a mile ahead of you and you wouldn't see him for three or four hours. He says, I'm going my merry way. That's what we call the outlaw dog.

But a field trial dog has got to run. If you go ride for 20 minutes and you find your dog a mile in front of you standing with his head high and his tail out, he's handling his game perfectly, he's won a championship. A field trial dog is also real polished. He doesn't make any mistakes. If he's steady to wing and shot, that dog will stand there whenever you shoot until you walk back to him. You don't know where the birds are at — you may walk 20 or 30 feet out there to flush your bird. Those birds fly, you fire your gun and that dog standing back there don't even lose his posture. That's what you call polished; that's what you call championship bird work.

You train the two dogs altogether different. You put a check cord on a foot dog. Let him pull it, find the birds and run 'em up, play with 'em. And then after awhile, when they really start to nail 'em — that's what we call point — you have somebody step on the cord after he points one bird. All right, let him run two more birds. Stop him after the second. Keep him on that way 'til you're stopping him every time he points a bird. And then he learns to stay there after he finds the bird.

For field trial dogs, you have to get on a horse, have some open territory and ride. See, you can't keep up with them on foot. He's got to run just like an outlaw. You turn him loose and he's half a mile away, just so you see him every 15 or 25 minutes, that's all the judges want. He's finding his own birds. And just let him run and find all the birds that he can find. But you got to work with him on his style. Put him in the yard and stand him up, work on his posture, so that his tail is high and his head high. Keep on until you can walk 25 or 30 feet out in front of him and he won't move. You got to have that dog polished.

When a dog points a bird, and another dog that he's running against sees him, he's supposed to stop and honor that dog's point. To train a dog to honor — or back — I used a piece of plywood and cut it out the size of a bird dog, just like he's pointing. Stick it down there in the bottom. Have your

***In a classic** scene from the 1950s, Don retrieves the bird for Bay Nowell. Don, an English setter, was Nowell's favorite bird dog. "If a covey of quail went across oak leaves, I've seen that dog pick up his foot . . . just like a cat," Nowell says.*

Jack Dermid

Jack Dermid

***Standing staunch to** wing and shot. The bird dog's pointing instinct has been described as "but the momentary pause before the wild dog's spring at his prey, developed by long training and selective breeding till it is stronger than the instinct to pounce upon the prey."*

bird in a little trap and whenever that dog you're working with sees this artificial dog on point, you stop him and let the other man that's helping you mash the little trigger in the quail trap like that and whap! it throws the quail right up in the air. This dog knows that dog is pointing.

I didn't use cages very much, but that's one way to do it to get him to start backing.

I broke a champion dog one time named Palamonum's Bo. He was one of the greatest dogs I've ever seen. This dog won the National Derby Championship in Alberta, Alabama, in 1971 but then had all of his medals stripped when he was found to be slightly overage. When I first saw him, he would lay down on his point. He had an excellent nose on him but he would lie down every time you started to flush the bird. Fall flat on his stomach. It was the worse thing there ever was to get him standing up. I'm going to pat myself on the back because I don't think there was another trainer in the United States that could have broke that dog.

I put this dog on a barrel and put a little round stick under it so that it would kind of rock back and forth. That barrel is moving and he's going to try to brace himself and he'll get real still. And then you rub him under his chin to get his head up, and pull his tail at the same time. And rub him down the back and say "Whup" — that means "Whoa." I'd walk around the barrel and he'd stand there posed. Then you would go out a little bit further. You got to learn to walk off because you're going to flush game out yonder and you want him to stay here. You don't work him too much. Just a little bit today, some the next day. After awhile you put him on something lower. And after awhile you put him on the ground.

To break a dog to wing and shot, you've got to do that. It takes continuous yard work, and I've seen the time that you almost give

up on a dog. A bunch of men gave me a steak supper for breaking Palamonum's Bo. Everyone knew he had everything but the standing up. He won 12 or 15 times.

In training dogs, this is the first thing I would go to every time I took a dog out. I'd use a quail harness that I invented. You have progress so fast, you wouldn't believe it. A quail harness is kind of like a vest that goes on the quail's body with a little opening to put your quail head in, and a band around the middle of his body that snaps on. You put an 8-foot long fishing line on an 8-foot pole and that's what you work your dog with. You can take the dog out in dense places, catch the wind coming to you and you put this bird down. That dog comes by the line of that scent and he'll hit it every time just about. And that's the very best way to start a dog to pointing.

I've had people come over here and say, "I'll give you $25 if it takes five minutes or it takes an hour to just make my dog point a bird." I take that little ol' harness, put a quail in it, go down to the woods and get that dog to point a bird. I've picked up many a $25 in 10 minutes.

One time when I was training, this man said, "Bay, this dog runs about 30 minutes and he just gives out of breath. I want you to try him and see what his problem is."

I could have took the man for a ride. But when I got the dog the collar was choking him. I said, "C.G., this is your problem. You don't have to pay me anything for it. Your dog's collar is too tight."

You never know it all, if you get to be 150 years old and train dogs every minute, you'd never learn it all. Dogs got different personalities, every one of them. You got to learn to outsmart that dog. If you do, you got the thing won.

Some dogs don't care what they do, where they do or how they do, but it takes a long time to find out exactly what his personality is. You got to keep tinkering with him 'til you find out. And some of them, if they ain't going to make it, get rid of them and start again. Because it ain't no use throwing your money and time away for something that won't be worth fooling with.

Another thing about personalities is that some dogs just know where to find a bird. Some can hunt their head off and never find anything. I guess you can compare 'em with two children taking music lessons. One of them can go on and practice, practice, practice, and never make as good music as the other one. Dogs are the same way.

There are two mistakes a person can make when he's training a bird dog — hollering at it too much and shooting over them too quick. I saw this the first year I ever trained. The dog was standing just as purty as you ever seen and a man walked up behind the trainer and said "Whoa!" And that dog turned around and backed off of that bird, and after that he never was no count. Because of one little ol' error.

To get a dog used to the sound of a gun, let the dog point a bird or run 'em up and chase 'em. As he's chasing 'em let him get about 100 feet from you and then fire your gun. But I would advise starting with a smaller pistol or something. I've known some trainers to shoot while they're eating, but I don't think that's good. I think you just got to take that dog out and just walk with him as a pup and let him develop himself and let him get into a few birds. And then start shooting with a shotgun over him whenever he starts to running up birds. Then you don't have no gun-shy dog.

Most gun-shy dogs are man-made. With a broke dog don't shoot over his head too much. Say a dog is pointing a covey of birds. You know those birds are way out yonder. Most people walk right up behind that dog and shoot right over his head. It'd be better if you went around that dog and come out between the dog and the bird.

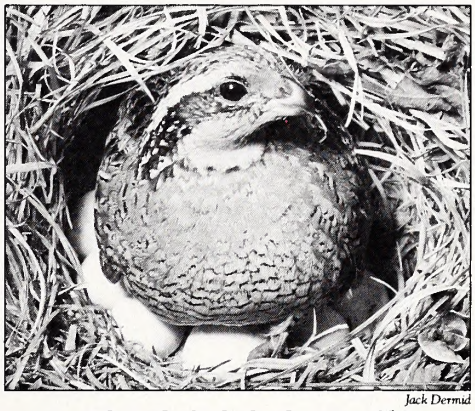
Most of my success with dogs came from experience and thinking, laying here at night and wondering what I was going to do with ol' so and so. It was hard to pattern after another trainer because you had a different dog than what he had. You had different personalities.

Here's some advice for someone who's going to buy a puppy. I'd pick out whether I wanted a pointer, a setter, a Brittany spaniel or a Boykin spaniel to start with. And when I found a litter of puppies of my choice, I'd pick one that played around my feet most. That's the one that would be apt to be most mindful.

Suppose you're going to buy an older dog. Say the seller is going to tell you he's a good dog and you kind of doubt him. You pull up his ears and look at him. If you see brier scratches real bad in his ear he's been hunted. Now whether he is broke or not is another story, but he's been worked. But if his ears are real clean and the pad of his foot is tender, you know he's a pen dog.

When I was young, you could go out and find eight to 10 coveys of birds a day. You didn't have to worry about buying a bird to train a dog with. That was about 40 years ago. I was in my thirties then. I began to notice them giving out in the sixties. When I built my kennel, I remember there were birds everywhere just about. You could go out and find five or six coveys in that little area where I trained the dogs.

I believe quail have declined partly because of cats and possums. They destroy the birds' nests. But the worst enemy they got is the tractor. People farm and they go right around and cut every bit of the land, cut it right clean. And the birds got to the point where they stay in the woods now. When you farmed with mules and horses, you wouldn't get up your corn 'til after Christmas. And the birds would feed there and they had cover to keep the hawks from catching them. Now you just got a naked field. The bird has got to run out to the edge near the bottom, pick him a few beans and go right back in.



Jack Dermid

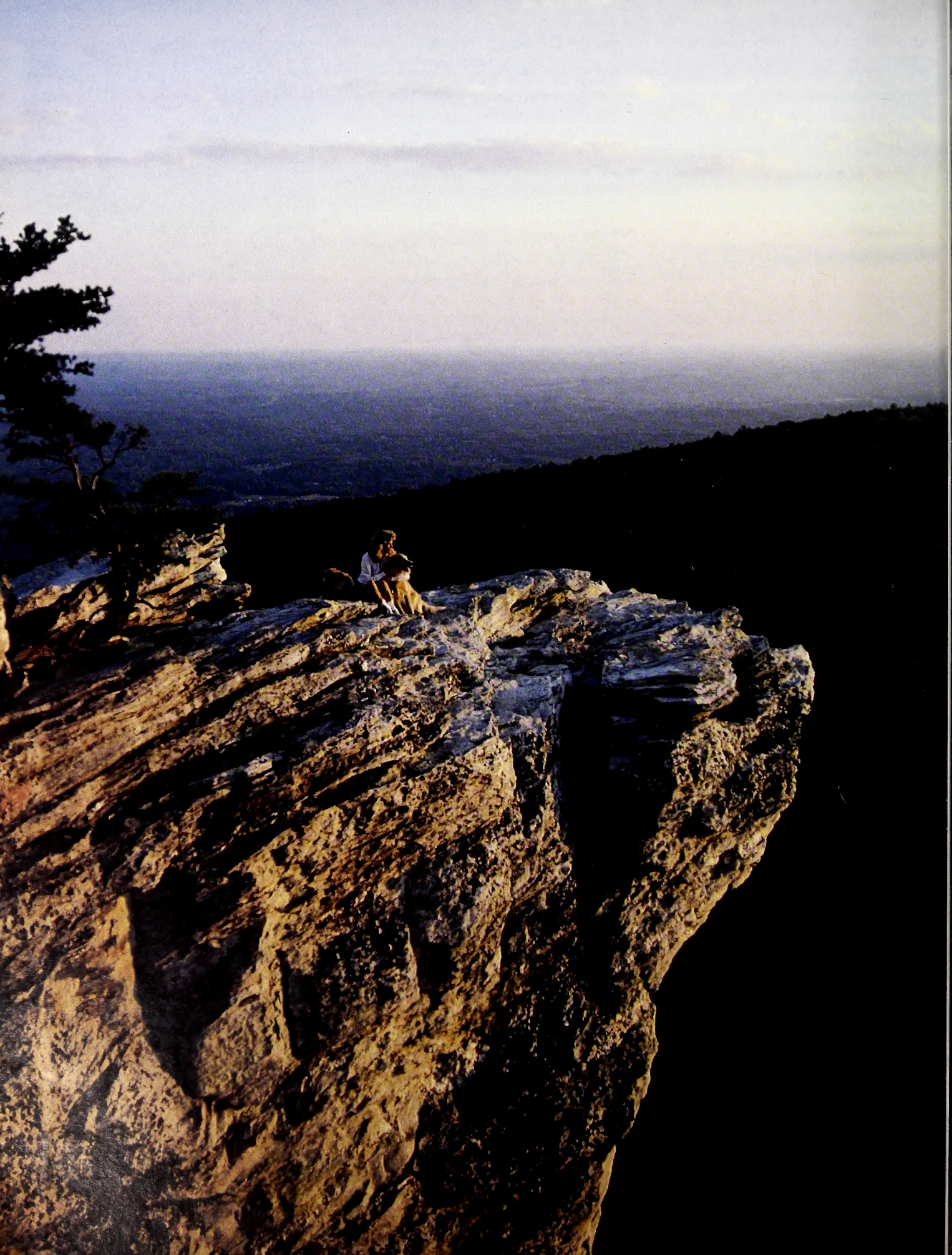
***Though the bobwhite** quail has changed its habits over the years, the bird is still out there in good numbers, Nowell believes. "I can find coveys that I found when I was a boy," he says.*

But the quail is not as scarce as you think. Quail are smart. I can go and find quail that I found when I was a boy. That covey is still there. Unless you kill out a covey, there's going to be a covey there.

All in all, this is God's country here to me because I was raised here. You got a lot of streams and natural habitat for birds. It's got more cover here and the dogs have to hunt for their game. Down in the eastern part of the state, you have these long canals, maybe a half a mile long and the birds are right in those canals under that brush. They are the meanest bird in the world to kill. But here you've got some fields and some woods, a little branch over yonder. The country here is more natural.

I'll tell you one thing I've learned. Some dogs have got more sense than the hunter's got and that was certainly true of ol' Don. If I had a bad day of shooting birds, he'd stand there and look at me as if he was saying, "Well, what's wrong with you? Ain't you shamed of yourself?" ⊠

"Carolina Profile" is a periodic feature in Wildlife in North Carolina. *In these interviews, men and women reflect on their outdoor experiences and on what the land and its resources mean to them.*



THE MOUNTAINS AWAY FROM THE MOUNTAINS

Hanging Rock State Park in the Sauratown range towers over the flat, surrounding Piedmont, and visitors are invariably impressed by this remarkable bit of topography.

by Terry Shankle

My first visit to Hanging Rock State Park was in the mid 1950s with a youth group from my hometown of High Point. I remember little about the park, no doubt because kids care very little about gorgeous scenery, delicious solitude, and wild places. That was 30 years ago, and on my second trip to the park last year, I was a bit more appreciative of what it had to offer.

Of course, I'm not the only one who's been converted by the park's rocky promontories, sylvan trails and shimmering waterfalls. Over 250,000 visitors a year are availing themselves of the pleasures of this Piedmont attraction. Situated in Stokes County, almost due north of Winston-Salem, the 6,000-acre Hanging Rock State Park is a monument to those who began setting aside parcels of land for it in the 1930s.

The park is accessible from N.C. 89 north out of Walnut Cove and Danbury; N.C. 66 north out of Rural Hall; and N.C. 52 at the King exit, through King to N.C. 66 north. Large brown signs lead you to the park from any of these highways. The park is also marked, as are all state parks, on all North Carolina road maps.

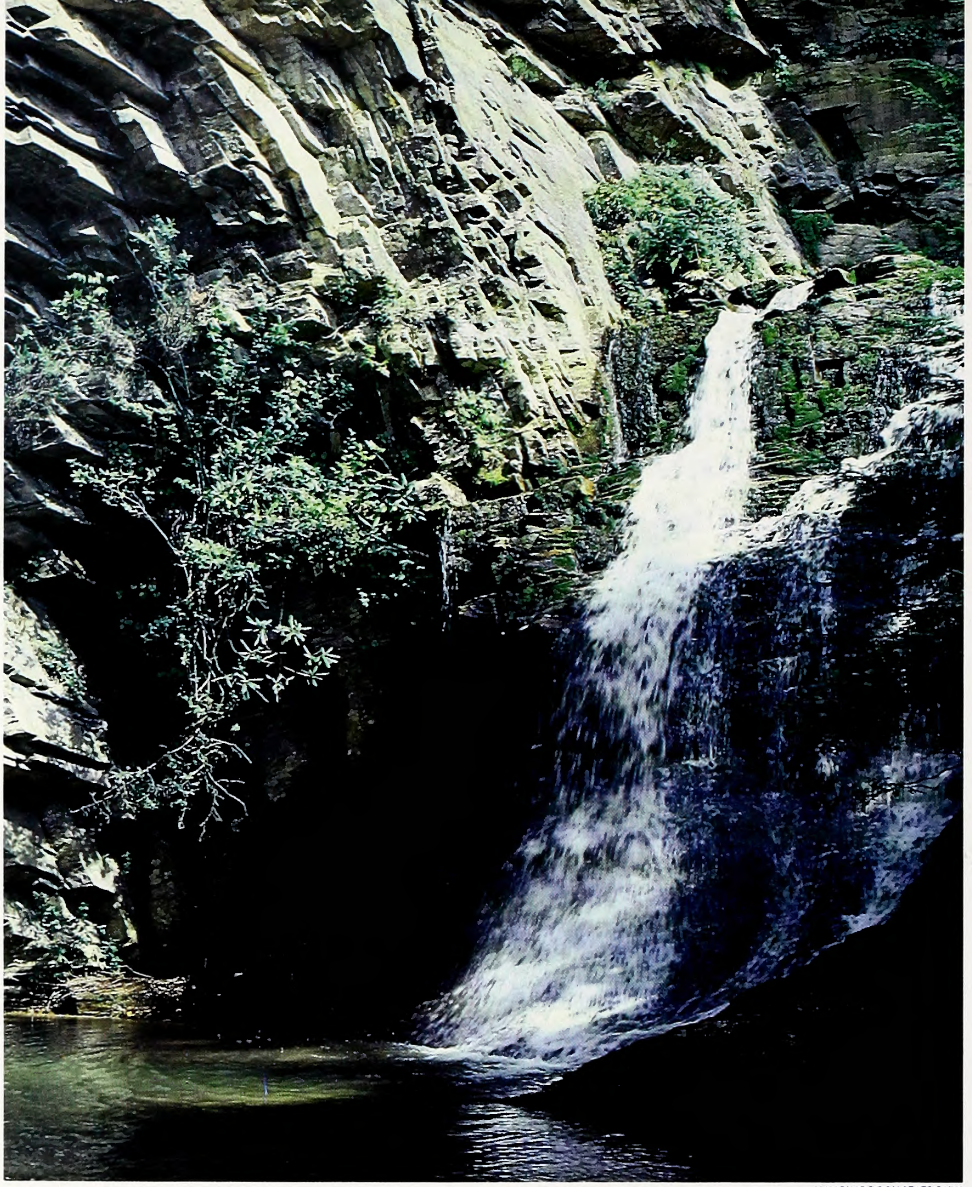
A part of the Sauratown Mountains, Hanging Rock is one of several quartzite mountains inside the park boundary. Wolf Rock, House Rock, Devil's Chimney, and the very prominent Moore's Knob which is often mistaken for Hanging Rock, are the other peaks that rim a U-shaped valley in the park opening to the northeast. Several miles west of the park is Sauratown Mountain. Studded with many radio and television towers, Sauratown slopes skyward from east to west. Farther west, and across N.C. 52, Pilot Mountain rises alone. Now a 2,000-acre state park in its own right, Pilot Mountain, with its sheer rock walls, is one of the most prominent landmarks in North Carolina.

The Hanging Rock area has always been considered somewhat unique, but this did not spare the area from heavy logging around the turn of the century. In the mid-1930s, the Stokes County Committee for Hanging Rock State Park was founded as a private citizens' group to pursue the establishment of a park. This committee worked with the Winston-Salem Foundation, a nonprofit holding group, to identify and acquire available lands. On April 20, 1936, the deed was acquired for the first tract of Hanging Rock State Park, and the State of North Carolina received a gift of more than 3,000 acres from the Stokes County Committee.

Over the next 46 years, additional lands were acquired through gifts, grants, and direct purchase by the state. The last acquisition in 1982 was a 470-acre tract that tied the park to the Dan River in the valley north of the park. That purchase, as well as others made since the early 1970s, was orchestrated by the Northwest Environmental Preservation Committee.

"I could spend days telling you tales about the various deals to acquire more land for Hanging Rock and Pilot Mountain state parks," says Joe Mathews, executive director of the Northwest Environmental Preservation Committee. "Many parcels were gifts to the state while others have been purchased with grants and matching federal funds. During one transaction we found, for example, that the state did not own the land where we had many of the park buildings. That could have been extremely embarrassing, but while straightening out the mistake we were able to put together a deal that brought those last

***Located in the** northern Piedmont, Hanging Rock State Park offers fine hiking close to major cities. Over 17 miles of trails are found within the park, and a portion of the Mountains-to-the-Sea trail connects Hanging Rock with Pilot Mountain State Park.*



HANGING ROCK STATE PARK

***The Lower Cascades** waterfall is one of several handsome falls at Hanging Rock State Park. Local efforts to protect the area began in the 1930s, and Hanging Rock became a state park in 1936.*

470 acres into the park."

Why does Hanging Rock and the rest of the Sauratown Mountains rise from the relatively flat land of the Piedmont? Geologists believe that millions of years ago, the entire Piedmont was covered by shallow ocean water. Mud and sand deposited on the bottom eventually turned to sandstone and shale under the pressures exerted by tremendous weight. As pressures and heat from inside the earth continued to increase, the sandstone became quartzite, and the shale became mica schist. The quartzite, which is much harder, forms what are now the ridges, cliffs, and peaks in the park, and the mica schist, which is much softer, eroded more quickly and now is found mostly in the valley floor.

From a distance, the Sauratown Mountains, including Hanging Rock, look taller than they actually are because they stand alone, and are often referred to as "the mountains away from the mountains."

Even before Hanging Rock became a state park, the valley was the scene of considerable activity. In 1935, during the Depression, the valley hosted one of several Civilian Conservation Corps camps scattered across North Carolina, and from 1935 until 1942, the Corps carved the park out of the undergrowth of the valley, constructing the dam that impounds the 12-acre lake, and building trails and the road into the park. The Corps also constructed most of the park's buildings, the bathhouse, and picnic shelters.

"One of problems today is the old age of about half the buildings," says current Hanging Rock State Park Superintendent Tommy Wagoner. "The buildings were soundly constructed, but that was 50 years ago."

Still, Wagoner, who has been stationed at the park for approximately six years, believes the situation could be much worse. "The park is far off the beaten path, and visitors seem to take better care of it. People don't visit this park enroute to somewhere else. They come here because they want to."

The park has 73 year-round campsites located near the lake with central washroom facilities. The campsites are for either tent or trailer type camping, and there is also a youth tent camping area near the main entrance. No backpack camping is allowed in the park at the present time.

Two picnic areas with 137 tables and 32 outdoor grills provide ample space except on summer days when visitation is at its peak. Several of the tables are located under shelters and are popular for family reunions. All camping and picnicking sites are available on a first-come first-served basis. Six family vacation cabins are available for rent only by reservation from April through October. Rowboat rentals are also available on the park lake, and swimming is permitted during season at a sandy beach area.

For hikers, the park offers 17 miles of trails, several winding to the tops of the mountain peaks. Other trails lead hikers to several beautiful waterfalls: Upper Cascades, Hidden Falls, and Window Falls.

Naturally, the most panoramic views are from the tops of the mountains, but the trails leading up these mountains to Hanging Rock and Moore's Knob are steep and somewhat rough. Hiking shoes or boots are advised. A hike to the top will heat you up where you may become quickly chilled if you don't carry extra clothing.

While the main attraction is the "hanging rock," Moore's Knob has its own special feature, an observation tower. The tower provides its visitors with an unobstructed 360 degree view including the Blue Ridge Mountains in the distance to the northwest, and Sauratown and Pilot mountains to the west. Office buildings in Winston-Salem are often visible to the south, and Greensboro is sometimes seen to the southeast on the

KEN TAYLOR

clearest days.

By far the most heavily used trail is the Hanging Rock Trail, a .7-mile trail that is badly worn and washed because of its steepness and the tremendous amount of use it gets. "We hope money will become available to stabilize some or all of the Hanging Rock Trail before it deteriorates further," adds Wagoner. "Our latest addition to the trail system is in the newest part, and follows Indian Creek all the way to the Dan River. Indian Creek lies entirely within the Park, and can be given the total protection that is impossible for most streams. Further plans call for a canoe access area where the park meets the Dan River."

From June through August, a full-time naturalist is on duty to assist park visitors, conduct hikes, nature walks, and give slide lectures two nights each week in the camping area.

Hanging Rock State Park is home to a wide variety of plants and animals, and rhododendron, wild azaleas, galax, mountain laurel and many ferns and wild flowers are abundant.

One very rare type of lespedeza grows nowhere else. Canadian and Carolina hemlock grow side by side, which is uncommon since the species are seldom found in the same habitat. The table mountain pine, with long, prickly scales on its cones, is another uncommon resident.

White-tailed deer, striped skunks, groundhogs, raccoons, bobcats, oppossums, foxes, cottontail rabbits, gray and flying squirrels are routinely seen, and native reptiles include snakes, lizards, and turtles in the more moist areas of the park.

"We realize the impact the park could have as an educational facility for nearby school systems, and we hope to be able to provide better services to educators in the future," says Wagoner. "In addition to me, there are three other fulltime rangers that could share the responsibility for teaching environmental education. Of course, we must continue to control heavy use of the park so it will remain attractive, and we'd like to be able to expand some of the boundary lines in order to protect several of the ridge tops."

Even within its present borders, however, Hanging Rock has rewards for its visitors, especially those who take the time to get away from the crowds and walk the more remote trails. And those who do will come away with a greater appreciation for this unique mountain away from the mountains.

Hanging Rock State Park is open daily year-round, road conditions permitting, beginning at 8 a.m. The park closes at various times depending on the season. Further information can be obtained by writing Hanging Rock State Park, P.O. Box 186, Danbury, N.C. 27016, or by calling the park at 919-593-8480. ⊠

TERRY SHANKLE

***The prominence known** as Hanging Rock (top) is a large, quartzite outcrop. A short trail leads to its top, but the trail has been badly eroded by heavy use. Blood root (bottom) is one of many early spring wildflowers found on Hanging Rock's wooded slopes. Carolina and Canadian hemlock, mountain laurel, and many other mountain trees and plants are also found there.*

Species Is Rare North Of Tropics

Green Sea Turtle Lays Eggs At Bald Head Island

Written and Edited by Mark Taylor

The beaches of Bald Head Island are lonely during the early morning hours. Often, the only people out are the biologists and volunteers of the Bald Head Conservancy, a private organization that helps manage and protect the threatened loggerhead sea turtles nesting on the island.

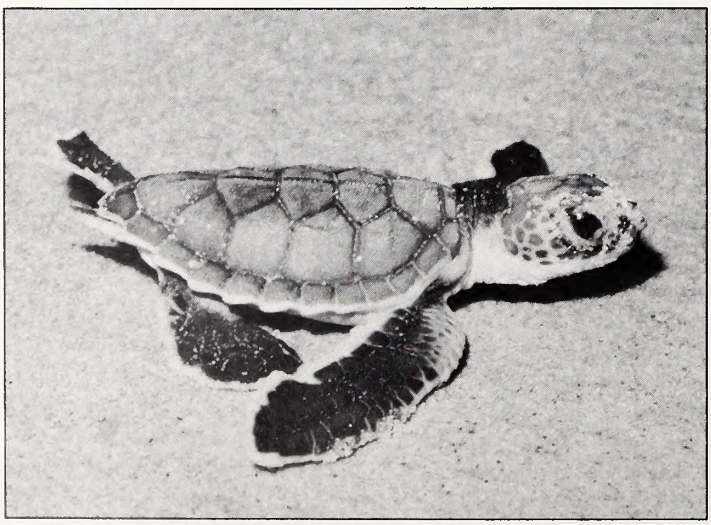
One morning last summer volunteers were surprised to find evidence that an unusual turtle had crawled up the beach to lay eggs and return to the water.

The presence of a turtle crawl was not unusual. In fact, 94 sea turtles nested on Bald Head Island last summer. But, these tracks were different. The crawl was nearly 6 feet wide, and the tracks revealed that the turtle had pushed herself up the beach with alternate thrusts of her flippers. Loggerhead sea turtles, which commonly nest in North Carolina, have smaller crawls, and leave the parallel marks of opposite flippers.

All of these characteristics indicated that this nest was laid by either a rare green or leatherback sea turtle. The nest would have been a northern record for leatherback turtles, but green turtles are known to have nested on Onslow Beach in Camp Lejeune three times in the 1980s.

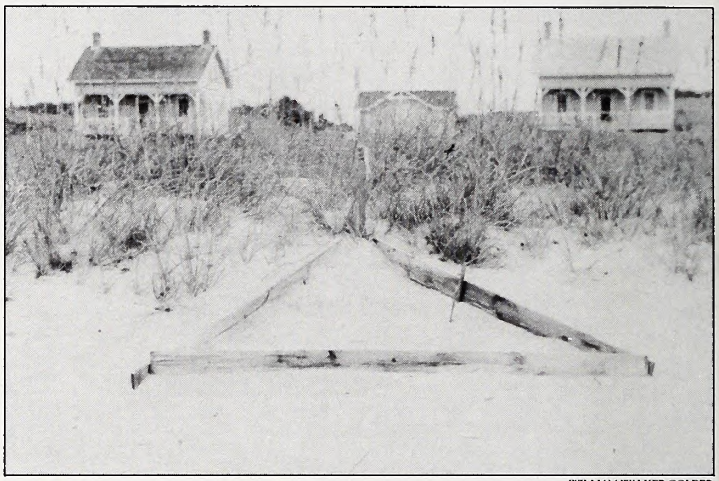
The nest was located only a few feet above the high tide mark, and was in danger of inundation by salt water. Consequently, the nest was moved to a safer spot. Buried within the nest were 154 turtle eggs the size of billiard balls — considerably larger than the ping-pong ball sized eggs of a loggerhead sea turtle.

After the eggs had incubated 60 days, the nest was boxed and watched very closely. A slight indentation in the sand above the nest early in the morning of October 11 indicated that the eggs would probably hatch within 24 hours. At 7:25 that evening, 116 green sea turtle hatchlings emerged from the sand simultaneously and made a frenzied 30 yard dash for the sea. Twelve hatchlings were recovered from the water, and were transported to the North Carolina aquariums.



WILLIAM WALKER GOLDER

Making Tracks: *This young green sea turtle is one of 116 which hatched from a nest on Bald Head Island. Green sea turtles are endangered, and are rare north of the tropics.*



WILLIAM WALKER GOLDER

Safer Ground: *Barriers mark the green sea turtle nest. The nest was moved because it was in danger of being destroyed by salt water.*

Most sea turtles face a precarious existence. The loggerhead sea turtles which normally nest on North Carolina beaches are considered a threatened species. Green sea turtles are rarer, and are endangered. These turtles have been exploited for food and their shell throughout the Caribbean and Central America. The vegetarian diet of the green turtle also limits its food source, and makes it more sensitive to chances in the environment and pressure from coastal development.

Most of the green turtles found in the United States nest in Florida. The nests found on Onslow Beach and Bald Head Island, however, offer hope that these interesting animals will visit our beaches more often in the future.

— William Brook, naturalist
The Bald Head Conservancy

Focus On Open Space

State Greenways Conference Set

How can you preserve open space within a city? One of the best ways is with greenways, linear parks that often follow flood-prone creeks or river bottoms.

The development of greenways will be the subject of the second statewide greenways conference on June 1-3 at the Hilton Hotel at University Place in Charlotte. This conference will focus on combining greenways with efforts to protect water quality and wetlands. The conference is being organized by an informal group of professional greenways planners from across the state.

Information on this conference is available from Annette Liggett, Wake County Parks and Recreation Department, P.O. Box 550, Raleigh, N.C. 27602.

Farms Become Demonstration Areas

Anson County Farmers Put Quail Before Soybeans

The future of North Carolina's wildlife populations may lie in the hands of landowners such as Anson County farmers Al Griffin and Gary Rorie.

The two men feel sure they'll never make the covers of modern farming magazines, but as long as they're helping wildlife, they don't mind passing up the fame.

Their total 700 acres of fields and woods in the community of White Store offer a diversity of crops, wheat fields, managed woodlands and clear cuts. Paths are bordered by thick weeds and other wild plants that provide food and cover. And cornfields — months after the harvest — are unplowed.

Griffin's and Rorie's farms are two of nine demonstration farms that biologists with the Wildlife Commission and other agencies are displaying as ideal habitat to boost the state's wildlife populations.

The Commission — along with the N.C. Wildlife Federation, the Agricultural Extension Service, the N.C. Forest Service and the Soil Conservation Service — plan to invite landowners, school groups, civic clubs and others to see these techniques for wildlife management. The demonstration farms are the result of cooperative planning between the landowners and the agencies.

Deer, rabbits and squirrels love diversity of cover the brush on these farms provides. Deer grow rapidly eating the clover, wild weeds and corn left in the field.

A ride through the woods, around the ponds, and into the cornfields on Griffin's 450 acres shows there are many ways to provide wildlife with the habitat it needs to thrive.

Griffin's two ponds are marked with wood duck boxes. His trees are marked with "squirrel tires" — a modern squirrel's nest made from a discarded tire which is tied around a tree limb. There are salt licks and milo fields for deer, shrub lespedeza and weed fields for quail, and good habitat in general for red-tailed hawks.

"Other landowners had better wake up and start doing these same things if they want to have any wildlife," Griffin said of his practice of farming for wildlife. "I've been doing this for years. It costs me a little time and money, but it's worth it."

Griffin, named White Store Wildlife Farmer of the Year, and his wife are bringing up their children to be sportsmen. His cousin, Richard Griffin, helps plant food plots and disc the fields for wildlife.

Rorie has also been managing his farm for wildlife for many years.

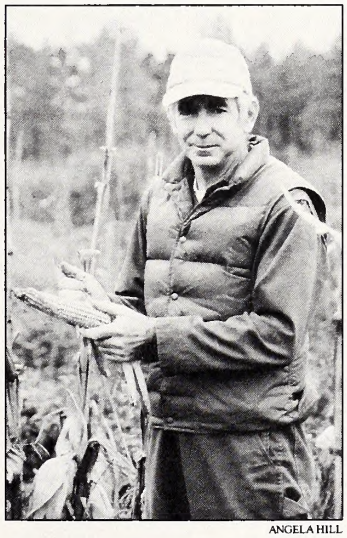
"I'm a farmer by trade. I raise hogs and turkeys and cows and soybeans. But you can't have a really 'clean' farm and still have any wildlife," Rorie said as he strolled through one of his corn fields, pointing out the many deer tracks and bare ears of corn. "I do it because I enjoy doing it and I enjoy seeing wildlife."

On the advice of biologists and other wildlife experts, Rorie and Griffin and other farmers have also disked permanent fire lanes around their property. Roughly every other year, they burn sections of their property so new growth provides better browse for wildlife and decreases the danger of uncontrolled wildfire.

"They truly practice wildlife management," said Terry Sharpe, small-game project leader for the Wildlife Commission. "We can come down and tell landowners about prescribed burning and the next time we come, they show us what they've burned. It's kind of a hobby to them. Some people play golf. They provide homes for wildlife."

The two-year project is designed to encourage wildlife management on farms that grow everything from Christmas trees and timber to tobacco or cattle.

"These practices may be used by a variety of landowners in North Carolina without excessive expense and labor," Sharpe said.



ANGELA HILL

One of the Best: *Anson County farmer Gary Rorie holds unharvested corn left in his fields for deer and other wildlife. His farm was one of nine recently selected by the Wildlife Commission as wildlife demonstration areas.*

Good Reading

Fly-Tying by Helen Shaw. Published by Nick Lyons Books, 31 West 21 St., New York, New York 10010. $16.95. 310 pp., hardcover.

Fly-Tying first appeared in 1963, and quickly became a favorite among fly fishermen. Fortunately, the book has recently been reissued.

This is, quite simply, the single best introductory book available for those who wish to learn to tie flies. Step-by-step instructions for tying basic wet or dry flies are included with black-and-white photographs to illustrate each procedure. With this book and a few basic pieces of equipment, anyone can learn to enjoy this interesting hobby.

Life In The Balance by David Rains Wallace. Published by Harcourt Brace Jovanovich, Inc., 111 Fifth Avenue, New York, New York 10003. $29.95. 293 pp., hardcover.

Life In The Balance is the companion volume to the Audubon PBS television series of the same name. This book encompasses the ecosystems of the world—our forests, oceans, mountains, deserts, skies, and polar regions. Each section tells what makes these ecosystems unique, how man uses and sometimes abuses them, and what efforts are being made to conserve their resources.

This book is very general; however, it is beautifully written and illustrated.

Field Notes

Season openings, closings, and regulation changes:

- Wild turkey season open from April 9 through May 7.
- Trout season open April 2 through Feb. 28, 1989.

Fishermen Urged To Help Projects

Bass Research Gets A Boost

Concerned anglers and fishing clubs are being encouraged to support bass research in North Carolina. The Wildlife Commission recently developed guidelines which allow for donations to the Commission to be used specifically for this purpose.

In the past, general donations to the Commission were placed in the wildlife fund and it was not possible to earmark donations specifically for bass research. Under the new guidelines, however, funds donated to the Commission for bass research will be placed in a special account. Research projects will be reviewed by the Division of Boating and Inland Fisheries, and when sufficient funds are available the research project will begin. These projects will be conducted by universities or other appropriate organizations.

"Fishing clubs, particularly, could be a great help in providing additional bass research in North Carolina," said Fred Harris, chief of the Commission's Division of Boating and Inland Fisheries. "For example, federal matching funds are available for many of these projects. We look forward to working with fishing clubs and interested individuals in the development of this program."

Fishing clubs and other organizations interested in supporting bass research in North Carolina should contact the Division of Boating and Inland Fisheries, N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27611.

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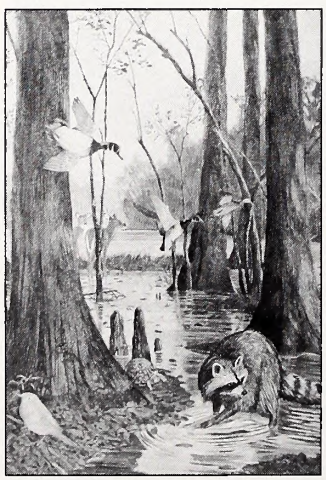

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Serves Whole Family

Turkey In The Straw A Feast

Spring means wild turkeys to Tar Heel sportsmen, and a successful hunt means a trophy for the table. This recipe was provided by Brian Hyder, who was formerly the Wildlife Commission's wild turkey project leader, and now works for the National Wild Turkey Federation.

Wild Turkey In The Straw
turkey breast sliced into serving-size pieces for 8
½ cup all-purpose flour
2 tsp. salt
¼ tsp. pepper
⅓ cup olive or vegetable oil
1 cup chopped onion
2 cloves garlic, minced
2 cups chicken broth
½ cup lemon juice
straw (recipe below)
lemon slices, ripe olives
2 eggs
½ cup cold water

Shake turkey pieces in a mixture of flour, salt and pepper in a plastic bag to coat evenly. Brown turkey pieces in hot oil in large skillet; remove and reserve. Pour off all but 2 Tbs. pan drippings; sauté onion and garlic until soft; stir in chicken broth and lemon juice until well blended. Return turkey to skillet; baste with part of sauce; cover skillet; lower heat and simmer 30 minutes or until turkey is tender when pierced with a two-tined fork. Line a heated serving platter with "Straw" and arrange turkey pieces on top; arrange lemon slices and ripe olives on turkey; cover with foil and keep hot while preparing sauce.

Sauce: Beat eggs with ½ cup cold water in a bowl; beat in 1 cup of the hot sauce until smooth. Stir mixture into skillet; heat, stirring constantly, until hot, but do not allow to boil. Taste and season with salt, pepper and lemon juice, if needed. Spoon part of the sauce over turkey; pour remainder into a heated sauceboat and pass separately.

Straw: 8 servings
1 package (8 oz.) spinach noodles
1 (8 oz.) package egg noodles
2 Tbs. butter or margarine
freshly ground pepper

Cook spinach noodles and egg noodles in a large kettle of boiling salted water; drain and return to kettle. Toss noodles with butter or margarine until butter melts; sprinkle with pepper and toss.

Checkoff Helps Wildlife

TERRY SHANKLE

One of Many: *The saw-whet owl is one of many species of nongame wildlife found in North Carolina. Citizens may support the management and protection of nongame wildlife by contributing to the checkoff for the N.C. Nongame and Endangered Wildlife Fund on state income tax returns, or by sending a tax-deductible contribution to the fund (make checks payable to the N.C. Nongame Fund) to the Division of Wildlife Management, N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27611.*

Endangered Plants Found On Site

Penny's Bend Rabbit Research Area Unique

Just north of Durham off the Old Oxford Road lies a unique natural area along the Eno River called Penny's Bend. The area is the site of much of the Wildlife Commission's rabbit research work, and is part of the U.S. Army Corps of Engineers' lands around Falls Lake. Within Penny's Bend's boundaries, however, is a unique plant community more common to the prairies of the midwest than to the rolling Piedmont. And the management of this area not only preserves its unique vegetation, but also benefits a number of needy families.

There are three types of unusual plants found at Penny's Bend. One plant community contains species common to western prairies, such as the prairie dock and the hoary puccoon. There are also shale-barren species, such as the tall larkspur, from the Allegheny plateau to the north. One endemic plant — the smooth coneflower — is found only in 14 sites between Virginia and Alabama, six of them between Penny's Bend and Butner. What accounts for this diversity? Underneath Penny's Bend is a rare rock called diabase, and the weathering of this rock formation produces the unusual soils which support these unique plant communities.

The land at Penny's Bend is mostly rolling, open hills covered with grasses, brier patches and cedar trees. If left alone, however, the area would soon grow up into hardwood and pine forests.

"Our management goal is to keep this area in open fields," said Rob Sutter, an endangered plant specialist with the N.C. Department of Agriculture. Sutter is also a member of an interagency advisory committee which manages the area. "The endangered plants which grow here can only live in open fields. Also, we wish to keep the area open for aesthetic reasons."

The advisory committee has been marking pines and cedars which may be cut for Christmas trees. Non-profit organizations are then allowed to cut the trees and sell them. This year, the South Granville Exchange Club and two Boy Scout troops from Durham and Fuquay-Varina cut trees, and the proceeds from their sale bought food and winter clothing for needy families in Granville County and also helped support Scouting projects.

"The harvest of Christmas trees not only keeps the fields open, but also involves the community in the management of this natural area," said Sutter. "All the pine trees are removed from the fields, but some of the cedars are left for wildlife food and cover. Some trees are also used for brush piles, which furnish cover for birds and small mammals."

Penny's Bend is a good place to see many rare and common wildflowers. Both the N.C. Botanical Garden and the Eno River Association offer spring wildflower hikes on the area in April and May.

— *Jane Rohling*

JANE ROHLING

A Fine Harvest: *Removing young cedars and pine trees keeps the Penny's Bend area open, preserving habitat for several rare prairie plants which need lots of sunlight. The trees are sold at Christmas, and the proceeds help needy families.*

The Wildlife Endowment Fund Report

The Wildlife Endowment Fund is supported by the sale of lifetime licenses, lifetime subscriptions to *Wildlife in North Carolina*, and tax-deductible contributions. Only the annual interest from this fund is used for wildlife conservation, and the fund will play a key role in supporting wildlife programs in the future. Interest is earned through investments made by the State Treasurer's Office. For more information, write to the Wildlife Endowment Fund, N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27611.

Status on January 31, 1988

	Numbers Sold	Revenue Received
Lifetime Sportsman's License	44,136	$13,936,989.30
Lifetime Hunting License	310	71,482.34
Lifetime Fishing License	3,304	595,478.42
Lifetime Subscriptions to Wildlife in N.C.	1,276	161,398.17
Contributions	—	101,144.81
Fund Total		$14,866,493.04
Total Interest Earned	$2,543,385.68	

Calendar Of Events

April 7-10
1st Annual Oak Hollow Boat Float at Oak Hollow Lake in High Point. For more information contact Joe Cranford at 919-869-3516.

April 28-30
Spring Conservation Retreat at the High Hampton Inn in Cashiers. Sponsored by the N.C. Wildlife Federation and the N.C. State University Forestry Extension Department. Features demonstrations and sessions on fly fishing, outdoor photography, mountain folklore, wildflower identification, and conservation topics. For more information contact the N.C. Wildlife Federation, P.O. Box 10626, Raleigh, N.C. 27605 or call 919-833-1923.

April 28-30
38th annual Spring Wildflower Pilgrimage in the Great Smoky Mountains National Park and Gatlinburg, Tennessee. Features wildflower walks, workshops, hikes, evening talks, and other events. For more information contact the Great Smoky Mountains National Park, Gatlinburg, Tennessee 37738.

April 29-May 1
Dixie Classic Bowhunter Tournament at the Mecklenburg Wildlife Club in Charlotte. Three-dimensional target shoot under field conditions. For more information contact Al Parker, 8517 Woodthorn Pl., Pineville, N.C. 28134.

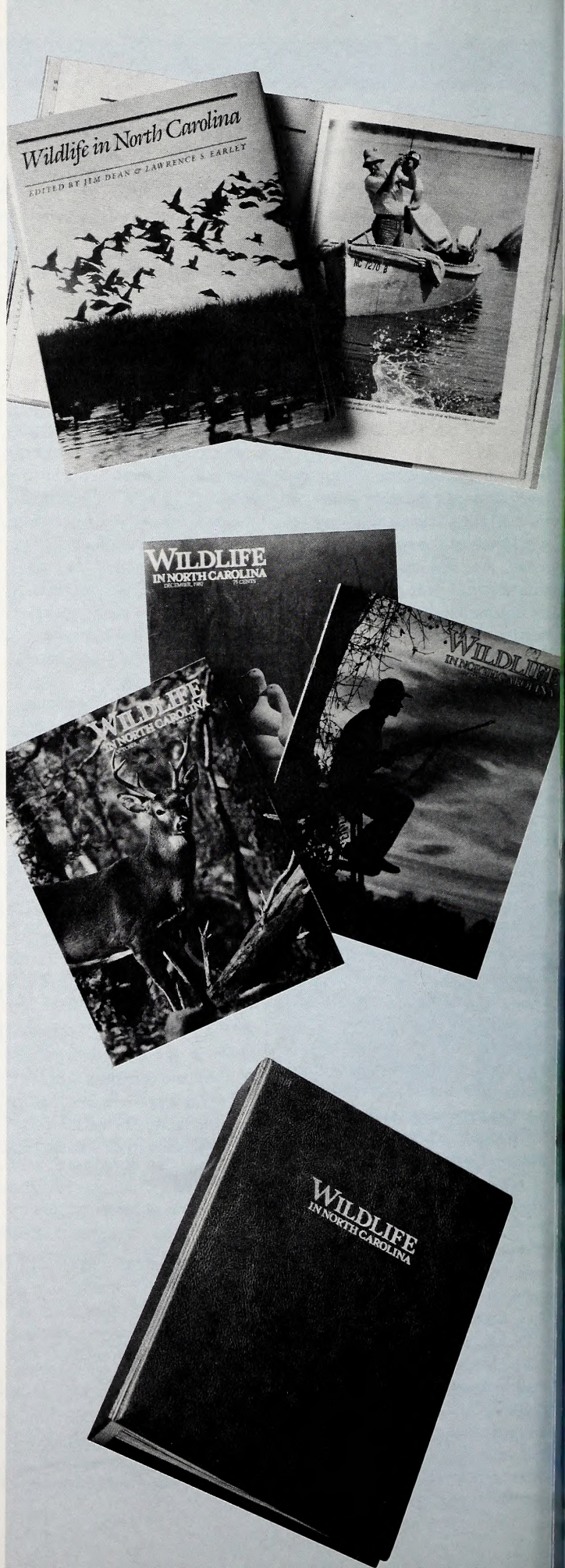
Everyone's talking about *Wildlife in North Carolina*... the book!

"This attractive book is probably intended for the sports or outdoors person; but in fact it should appeal to anyone with an active interest in our state's history, natural or otherwise."
— Michael McFee, *The Spectator*

"This book . . . is a fitting commemoration of the magazine's 50th anniversary. The book's four sections reflect the emphases seen each month, as the magazine seeks to interest nature lovers and environmentalists as well as the serious hunters and fishermen . . . ."
— Linda Brinson, Winston-Salem *Journal*

"It is not only for the sportsman in the family but for all the family and an excellent book to send both to Tar Heels who have moved away and to folks who have just moved into North Carolina . . . . The only fault I find with *Wildlife in North Carolina* is that it is not long enough."
— Buggs Barringer, Raleigh *News and Observer*

Published by the N.C. Wildlife Resources Commission and the University of North Carolina Press. Hardbound copy is $24.95 at your local bookstores. Or order direct using the special order form on the opposite page.



Your favorite fishing partner's biggest catch could be a lifetime license to fish and hunt.

(See application at left.)

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Strutting Gobbler

Benjamin Franklin believed the wild turkey would make a more fitting national symbol than the bald eagle, and certainly no female turkey would argue with that choice, especially while her beau is strutting before her in all his splendor.

LITHOGRAPHY BY EDWARDS & BROUGHTON COMPANY, RALEIGH, NORTH CAROLINA

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WILDLIFE IN NORTH CAROLINA

MAY, 1988 75 CENTS

Bright Side To Red Tide?

by Jim Dean

We caught a glimpse of it as we drove past last November — a sign of the times if there ever was one. "Safe Seafood," read the message on the restaurant. In smaller print, we could make out something about guaranteeing imported shellfish.

"Gee, everything seems to carry a warning label these days," remarked someone in the car.

A dispiriting thought, sure enough, but not lacking merit. Welcome to the years of living dangerously. Even oysters, clams and scallops are out to get us.

A few miles farther, we crossed the high bridge over Bogue Sound and turned north up the beach. Traffic was light and many cottages and businesses were boarded up. No one was fishing on the piers or in the surf. Although seldom truly crowded by Thanksgiving, the beach seemed more deserted than normal, abandoned to the red tide.

LAWRENCE S. EARLEY

"We can't see it in the water, but we've all been coughing and sniffling, especially when we walk out on the beach," our friends told us when we arrived. "It could be our imagination, or it could be the red tide. We haven't eaten any seafood. Heck, most of the restaurants are closed anyway."

Two days later, we crossed Core Sound in driving rain and spray. Our Marshallberg host checked his nets and found a dozen fat spotted seatrout (finfish aren't contaminated by the red tide), but nobody was dredging for oysters. The harbor was full of idle boats, and the whole area seemed under siege. Everyone talked about a lost season and overdue payments. Christmas was right around the corner.

"It's not so much this red tide that worries me," one commercial fisherman said. "The experts say it'll go away eventually, but even if that's true, I can't get rid of this notion that we're getting a glimpse of something that could be a lot worse and longer lasting," He's not alone. A lot of people are worried that the red tide is merely an omen.

The red tide itself is a temporary problem, although it may very well return this summer or again in some future year. Red tides are a routine nuisance along the Gulf Coast, and even early explorers reported their occurrence long before there was any development or pollution in that area. It is no coincidence that The University Of Alabama chose Crimson Tide as a nickname. It sounds better than The Fighting Dinoflagellates. Nor does the red tide plague only warmer waters. It occurs in Long Island Sound, and has been reported as far north as Alaska.

The red tide is caused by one of a number of species of tiny, single-celled aquatic algae that occur normally in many waters. When their numbers multiply greatly, however, they tend to turn the water a reddish or yellowish color depending upon the species involved. Not all of these tiny dinoflagellates — so called because they have a tiny hair-like flagella or tail that permits them to move around — are toxic, and even toxic species may cause different symptoms. Unfortunately, the species that contaminated North Carolina's waters contains a neurotoxin that can affect the nervous system of other creatures, including man.

These toxins do not accumulate in the flesh of fish, crabs or shrimp, but they do concentrate in the digestive systems of oysters, clams, scallops and other filter feeders, making it potentially dangerous to eat them.

Although red tides are considered a natural phenomenon, a few scientists have tentatively suggested that their concentrations might be encouraged by nutrient pollution occurring naturally or introduced by man. But that possibility has not yet been established. Of course, knowing that red tides are natural and temporary is small solace to those who suffer through these disasters.

Still, there may be a benefit to be gained from our experience with this unwelcome visitor. We have seen firsthand what it would be like to live in a poisoned environment. We've learned the costs of unhealthy coastal waters. Less seafood, poor fishing, limited boating, wheezing on the beaches — a sad world indeed.

We've also had a bitter taste of the economic effects, effects that reach far beyond a limited seafood platter. Commercial fishing, sport fishing, restaurants, housing construction, retail shops, boat-building and countless other businesses and recreational activities along our coast depend upon the health of our estuaries. Together, they form the core of this region's entire economy worth millions of dollars annually. Lose the natural resources that support our economy and we might as well sign up half the state for welfare.

Yet, that is precisely what we face unless we find a way to control creeping pollution and other permanent threats to our priceless estuarine resources.

The last thing we need is a permanent red tide — one we could have prevented.

May, 1988
Volume 52, Number 5

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WILDLIFE IN NORTH CAROLINA

Wildlife in North Carolina is the official educational publication of the North Carolina Wildlife Resources Commission, and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources and the environment we share with them.

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DEPARTMENTS

Our Natural Heritage *by Jim Dean*

Nature's Ways *by Lawrence S. Earley*

Back Of The Book *by Mark Taylor*

Cover *Now if you could only catch one this big. Alas, bluegills reach this size only with the help of a photographic enlarger. Eugene Hester shot this closeup of a bluegill and popping bug.*

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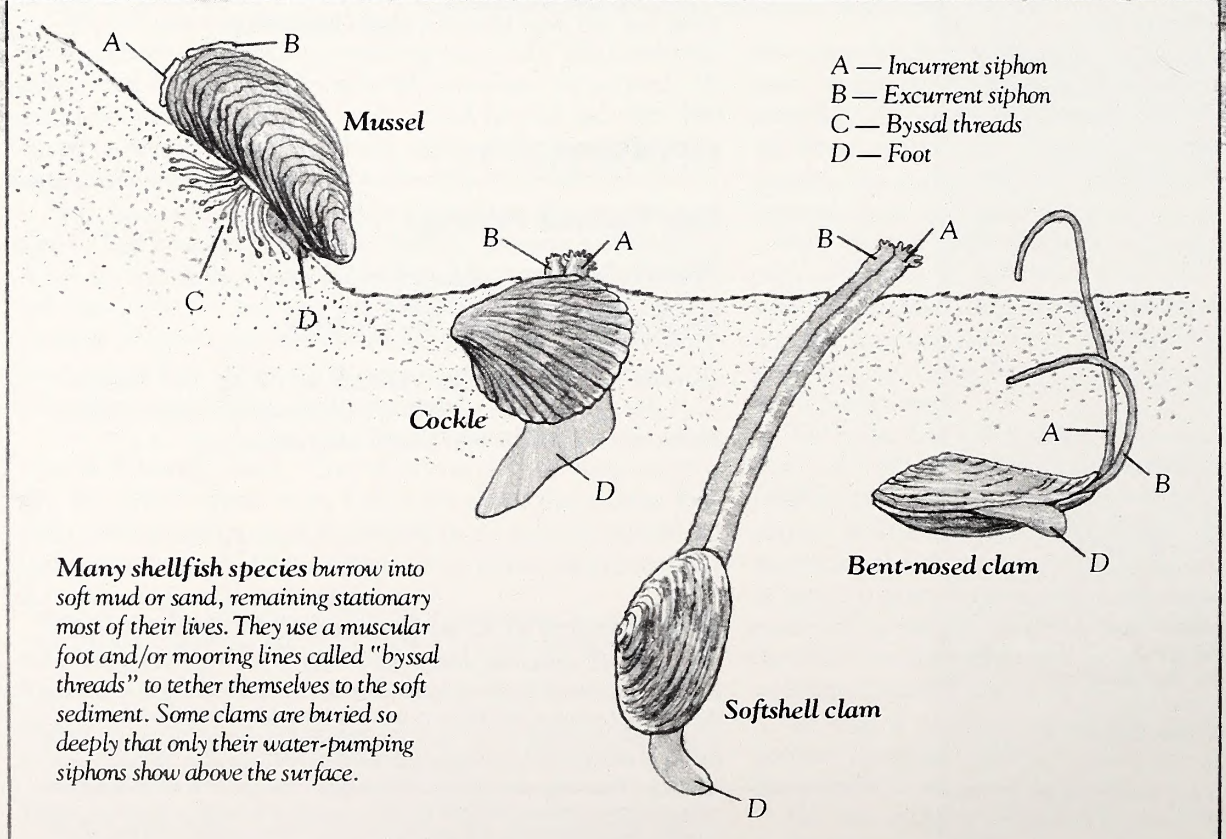
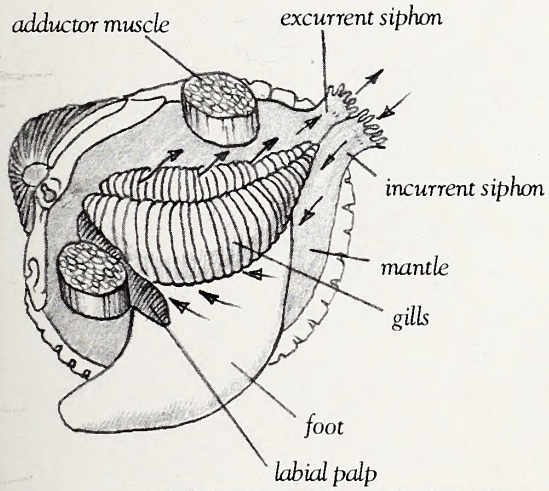
An oyster bed *in a coastal marsh rides high and dry at low tide. Oysters and other shellfish such as clams, scallops and mussels are filter feeders, removing food particles from the water by means of sticky hairs.*

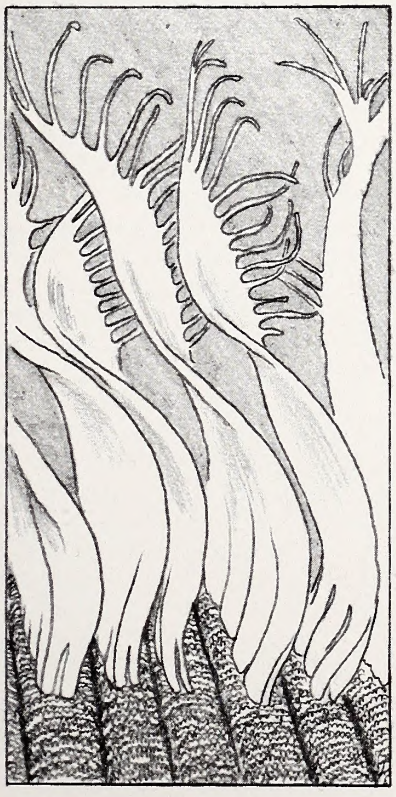


Many shellfish species *burrow into soft mud or sand, remaining stationary most of their lives. They use a muscular foot and/or mooring lines called "byssal threads" to tether themselves to the soft sediment. Some clams are buried so deeply that only their water-pumping siphons show above the surface.*

Illustrations (left and top right) after Thomas M. Niesen, *The Marine Biology Coloring Book* (Barnes & Noble, 1982).

Shellfish feed by *pumping food-laden water into the interior of the shell to be filtered. In the case of the cockle (below), water enters through the incurrent siphon and exits, carrying inedible material and waste, through the excurrent siphon.*





Inside the shell, *tiny hairs, or cilia, growing on the gills filter plankton from the water and pass it toward the mouth. At the labial palps — the fleshy lips guarding the mouth — more cilia make a final sorting.*

The Filter Feeders

written by Lawrence S. Earley / illustrated by David Williams

When the red tide contaminated much of North Carolina's coastal waters last winter, authorities banned the sale of shellfish but not fin fish. This unequal treatment was based on the firm understanding of one of nature's most elaborate and even bizarre feeding mechanisms, the filter-feeding apparatus of shellfish.

Picture the world of the sedentary mollusks we call shellfish (clams, oysters, scallops, mussels, etc). They are inundated by water most of the day, but the water teems with the microscopic plants and animals (plankton) that shellfish eat. It's also loaded with silt and other inedible materials. The chief challenge facing early bivalves was to perfect a way to sift food out of the water without fouling its gills with silt and other debris. And indeed they did, by becoming filter feeders. The system functions a lot like a living conveyor belt.

The key to their success was the development of tiny hairlike structures called cilia that grow all over the mollusks' gills. These cilia have specialized functions. One set, growing along the side of the gill, beats rhythmically to produce a current. Food- and oxygen-laden water is pumped into the shell at one point and pumped out at another, removing wastes and inedible particles as it goes. A typical clam or oyster can pump a couple of gallons of water a day through its interior.

But there's more to this story than a water current. The incoming water is intercepted by another set of cilia that removes small food particles and passes them forward toward the mouth within a rope of sticky mucus. If you can visualize a football fan being passed from row to row of giddy fans atop a sea of waving arms, you've probably got the general idea of the way cilia work. Still another group of sensitive cilia is in charge of separating larger, inedible particles from the water current and directing them to the outside of the clam for rejection.

Within its ropy, mucous sheath, food particles finally arrive at the mouth. There they undergo another inspection and further sorting by more cilia surrounding the mouth. These waving hairs accept some of the food particles and reject others. At this point it's not quality but size that counts. Only if it's too big does it not get a pass. The tiny hairs at the clam's mouth act less like a quality-control inspector than a crusty school marm separating children by size for the school photo.

One of the food particles these cilia admitted last winter was the *Ptychodiscus brevis* algae of the red tide. With clams and their kin filtering their usual several gallons of water a day, tremendous amounts of the algae were being concentrated in shellfish guts. Slipping a couple of contaminated clams down your gullet could have landed you in the hospital suffering from nausea, vomiting, diarrhea and other ailments. On the other hand, you could have dined on a gray trout and lived to tell the tale because trout doesn't feed on algae and, besides, we eat the fish's flesh, not its guts.

By February, the red tide had moved away from shore and shellfish were once again pumping clean water through their systems. Because of this remarkable ability, they can purge themselves of toxic contamination, given enough time. By March the clams were judged clean enough in most places to be eaten and oysters were soon to follow.

Bugs For Bluegills

When bluegills spawn this month, the most exciting way to catch them is with a flyrod and popping bug or wet fly.

written and photographed by Eugene Hester

It was one of those balmy spring mornings, and the sun was just beginning to peep over the horizon. It was so calm we could see swirls made by fish feeding in the shallows.

Using our flyrods, my brother William and I began casting tiny artificial insects toward the swirls. Those bluegills were aggressive and quickly came to the surface to slurp our bugs. It reminded me of a time long ago when William and I stood on the side of a farm pond and tossed grasshoppers into the water. The hoppers would swim on the surface, radiating little concentric circles. They would pause, then move again and suddenly the grasshopper would disappear in a splashy gulp. Another breakfast served and relished.

Bluegill sunfish, also known in these parts as bream, dearly love insects. Not only do they eat grasshoppers, but also crickets, ants, gnats, caddis flies, mayflies, mosquitoes, midges and a host of other insects. Almost any real bug living in, or falling in, water is fair game.

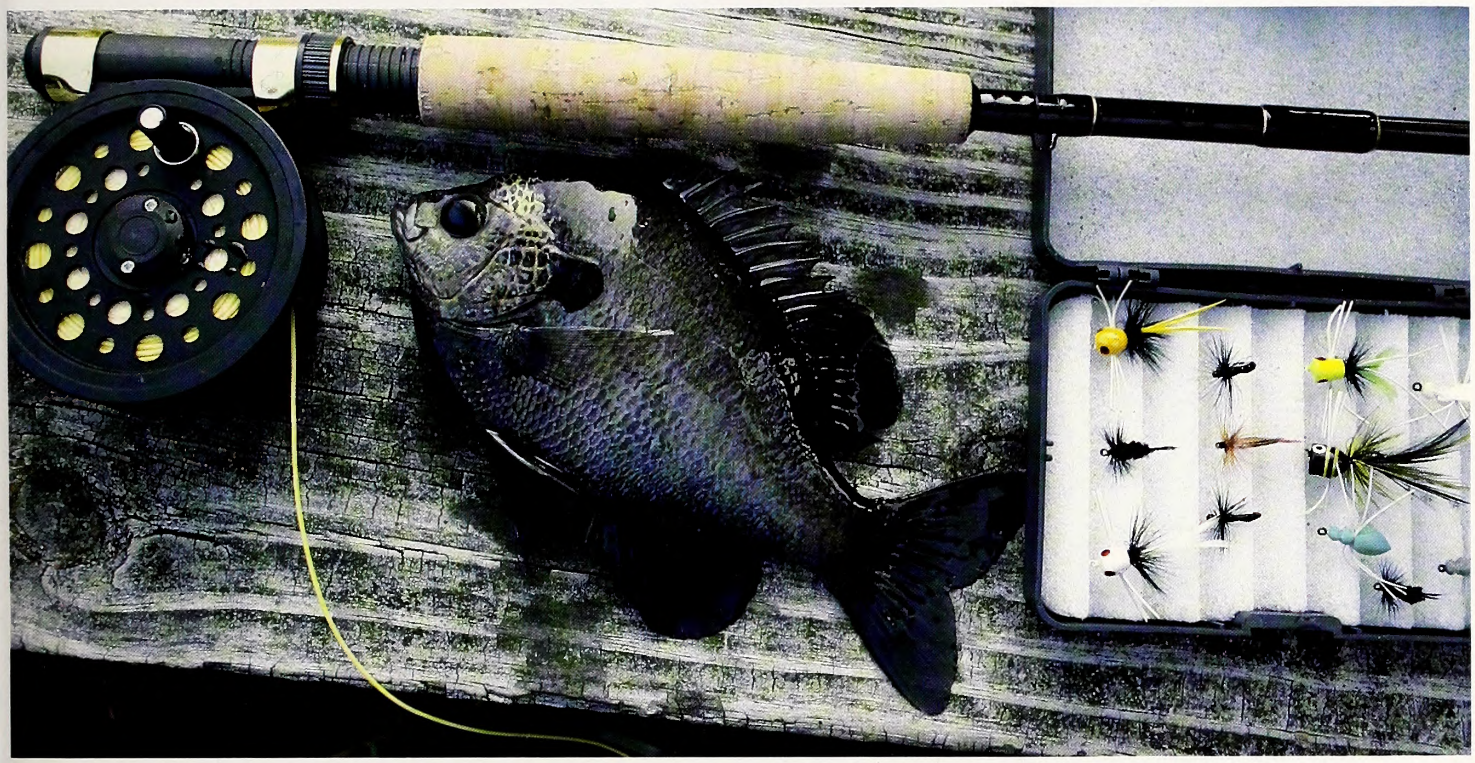
By using feathers, fur, cork, thread and other materials fly fishermen long ago learned to create realistic imitations of insects on small fish hooks, and such lures are commercially available in most sporting goods stores. Unlike a spinning or casting rod, where the weight of the lure pulls the thin line from the reel, a flyrod uses the weight of the line to carry the tiny fly or bug. You don't need a fancy flyrod to catch bluegills. Most will do the job. My favorite is an 8½-foot rod with a size 7 weight-forward floating line and a 7½-foot monofilament leader tapered to a 4-pound test tippet. Lighter, shorter rods will do just fine, but you probably wouldn't want one much heavier or longer.

My favorite flyrod lure for bluegills is a small, cork-bodied popping bug in size 8 or 10. It floats on the surface where you can see the fish strike. Many colors are effective, but my choice is usually solid yellow or yellow and black with rubber legs. White is also good, with or without a red head. Sinking flies also catch a lot of bluegills, and I particularly like red or black ants, woolly worms and sponge rubber spiders. You may find others you like better, but these have always worked for me.

Sometimes bluegills are very wary and you must approach them cautiously. That includes casting very delicately so that the line doesn't overly disturb the water. Bluegills seem to be most wary in very clear, still waters, and a long leader, small bug and delicate presentation at dawn or dusk usually

***Jason Hester** (left) flycasts with a small popping bug along the shoreline where bluegills have fanned out spawning beds. Bluegills (below) are easy to catch on floating bugs this time of year.*

Early morning is *a prime time to fish the beds, but bluegills will hit bugs all day if they aren't disturbed by too many fishermen.*



***Almost any artificial** bug or sinking fly cast around a bluegill bed will draw a strike since the fish are defending their nests. Because they're so prolific, however, it's virtually impossible to overfish a bluegill population. More often, there are too many stunted bluegills.*

work best. At other times bluegills seem unconcerned about how much ruckus a bug makes.

Bluegills usually reach their peak of annual spawning activity in May when the males build clusters of saucer-shaped nests on the bottom in shallow water, usually 1 to 3 feet deep. There may be anywhere from a dozen to 100 nests in a group. Since these bedding areas are such hot spots for fishing, it is important to be able to locate them. In clear water you can see the clusters of nests, but you can also find them by watching for little waves made by spawning fish in the shallows. Bluegills make a lot of waves preparing nests and chasing away minnows that would eat the eggs. Some people even find the nests by smell. The smell of a bluegill bed is hard to describe, but the next time you clean bluegills during the spawning season, pay special attention to the odor of the entrails. The ovaries and testes of the spawning fish are a major portion of the abdominal contents of the fish, and they give off a strong odor. Remember that smell, and when you smell the same odor while fishing, chances are you're near a bed.

If bluegills are so easy to catch during spawning time, shouldn't they be protected until after they reproduce? I asked Dr. Melvin Huish of the Cooperative Fishery Research Unit at N.C. State University that question.

"You don't have to worry about that," Huish said. "One female bluegill the size of your hand can easily produce 10,000 eggs in a single summer. I've never seen a pond which had too little bluegill reproduction. It usually works the other way — the bluegills produce too many young. Then, quite often there is inadequate food for them and they can't grow very large."

Around my hometown of Wendell, bluegill fishing in the spring is an annual ritual. William firmly believes that he knows the best time of the entire year for bluegill fishing. "The time to go, he says, "is during the full moon of May. That's when the bedding will be at its peak. You can catch them then, even if you can't catch them at any other time." And if that advice isn't specific enough, he adds, "and if there happen to be two full moons in May, go during the first."

William and I have caught a lot of bluegills by following that belief, and although I've never proven or disproven his theory, it could be simply because the entire month of May is such a good time for bluegill fishing.

Anybody who doubts that May is the best time to catch bluegills should stop at Joe Atkinson's store at Cattail Lake in Johnston County and look at the photos stuck on his bulletin board. William, Bill Hinnant and I stood there one day looking at the anglers and their catches.

"See this one," said Bill. "Thirteen pounds of bream on May 5, and over there is a 23½-pound catch of bream on May 13. Here's another with 21 pounds of bream on May 23." Those photos are enough to run the red line up on your fishing fever thermometer.

If you've been putting off trying this fascinating sport, this month is the time to get your flyrod and go to a farm pond, millpond or lake. Be there at daybreak, and move your boat along the shore with a paddle or trolling motor. The pond surface will most likely be smooth as glass, and you'll see those swirls as bluegills strike at surface insects.

Cast your popping bug or sinking fly over those swirls, let it sit for a few moments, then twitch the rod tip. And hang on. You won't forget the next hour or two. ⊠

Bedding Bluegills

A large colony of spawning bluegills may make hundreds of spawning "beds," and it's nearly impossible to overfish these prolific panfish.

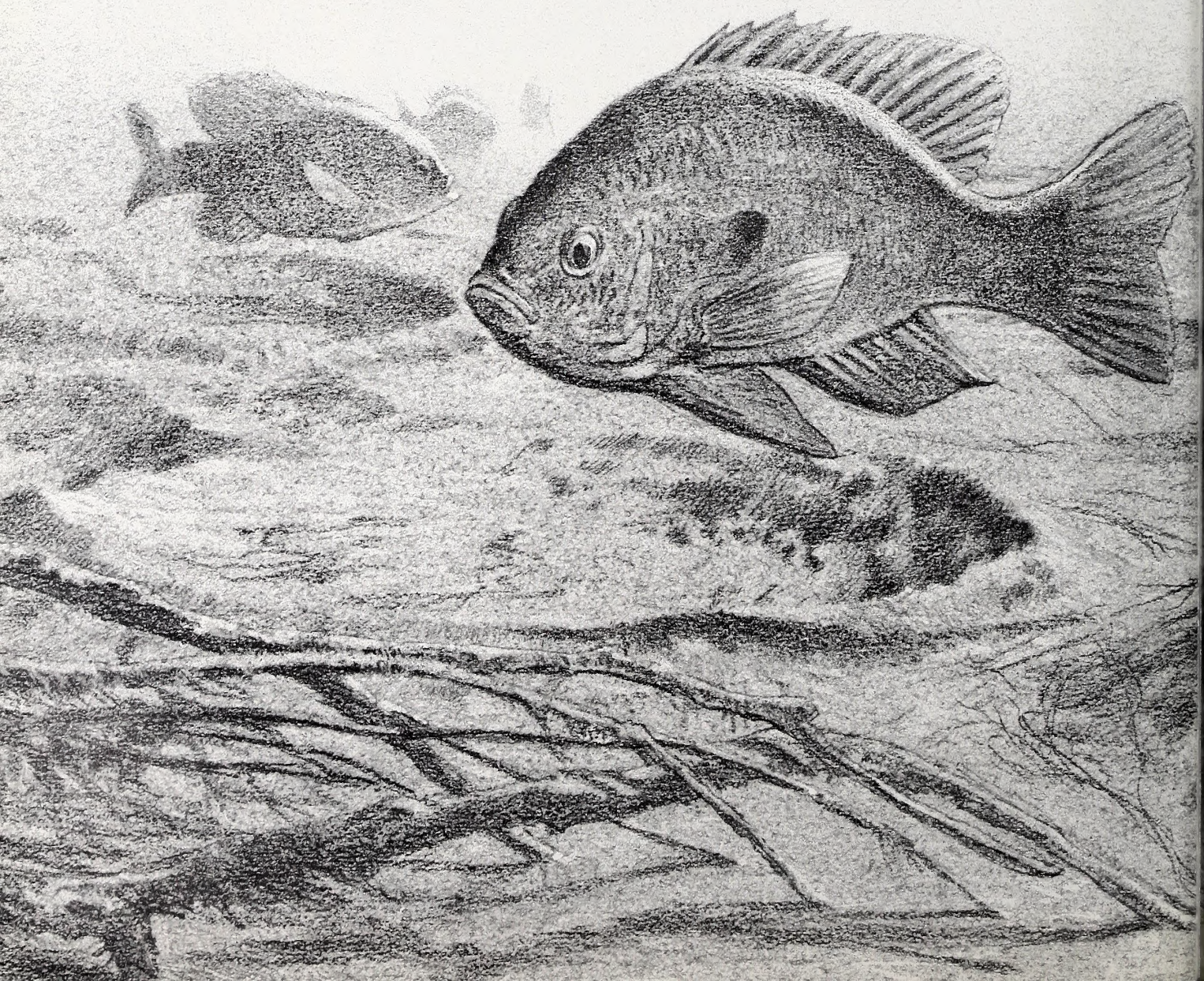
by Tony Mullis

Some bluegills in good condition may begin spawning when they are only one year old. By the time they are two years old, almost all bluegills are spawning.

Bluegills begin spawning when water temperatures warm to about 70°F. They spawn throughout the summer from May through September, but spawning activity usually peaks in June. There is often a secondary peak of spawning that occurs about a month after the first peak.

As spawning time approaches, male bluegills move into shallow water, 1- to 6-feet deep over a sand, gravel, or mud bottom. The areas are usually exposed to sunlight but may be shaded during part of the day. The males select suitable sites and fan out nests by sweeping motions of the tail that remove silt and fine sediments, leaving clean beds in

ILLUSTRATION BY DAVID WILLIAMS



which the eggs will be deposited. The completed nests are saucer-shaped depressions in the bottom that are 1- to 2-feet in diameter and about 2- to 6-inches deep. Many nests, or beds, are usually constructed in close proximity to each other and may occur in colonies of up to 500. Up to 30 nests may be crowded into 160 square feet of suitable territory. In such dense concentrations, the light colored beds may touch and have a honeycomb appearance which is easily visible in shallow or relatively clear water. Beds in deeper or cloudy water can still be detected by the presence of an earthy odor that is emitted.

When the nest is ready, the male bluegill attracts a female to it and they engage in a brief courtship that consists primarily of the pair of fish swimming about the nest in a circular path. After the courtship, the female releases her eggs into the nest while the male releases milt to fertilize them. Female bluegills lay from 2,000 to over 60,000 eggs, depending on their size and if they have spawned previously. A single female may lay eggs in several nests, and more than one female may lay eggs in one nest. A female bluegill may spawn as many as five times in a summer.

Bluegill eggs hatch about two to five days after they are spawned. The male bluegill defends the nest vigorously before spawning and until the eggs hatch and the fry leave the nest. However, the male sometimes eats the eggs and fry he was supposedly guarding. Nevertheless, all intruders that approach the nest while he is guarding it are violently attacked. Larger intruders are driven away while smaller ones, such as minnows and insects, are killed and eaten or carried outside the nest and dropped. This explains why small lures, spinners, artificial flies, popping bugs, and natural baits are so effective when fished over a bluegill bedding area.

The catching of fish while in the act of spawning and guarding their young may seem to be unsportsmanlike and to be poor conservation. However, bluegill are a very prolific species. So many eggs and fry are produced that overabundance is a bigger threat to the population than overharvest in most waters. Unless large numbers of bluegills are caught and removed, bluegills in a body of water can become so abundant that they exceed the food supply and become stunted. Relatively high harvest should be maintained to ensure good bluegill growth. ⊠

THE BIG DITCH

The Intracoastal Waterway is a very wet 3,000-mile "highway" from Boston to Brownsville, and North Carolina's portion may be the most interesting stretch.

by Bob and Mary Simpson

The U.S. Army Corps of Engineers claims a 3,000-mile highway from Boston, Massachusetts, to Brownsville, Texas, although it's admittedly a little wet. It's called the Intracoastal Waterway. Its purpose is to provide safe navigation between all coastal points from the Bay State to the Mexican border for commercial tows and other light-draft vessels not suited to navigating long stretches of the open Atlantic. The central portion of the Intracoastal is from Norfolk to Miami, with the heart of it found in North Carolina.

The Intracoastal Waterway was begun long before the American Revolution, but its progress was marked by spurts. The Carolina capes were a major motivator for completion. David Stick lists in his *Graveyard of the Atlantic* well over 600 ships, all exceeding 50 tons, lost along the Carolina shores prior to 1946. A single stranding of the

***Flanking the stormy** Atlantic, the Intracoastal Waterway offers ships protected passage from Massachusetts through Texas. This section of the 3,000-mile-long highway was photographed near Topsail Beach in Pender County.*

KEN TAYLOR

THE BIG DITCH

steamer *Huron* on Nags Head in 1877 cost 103 lives. Later, confronted by the ease with which World War I German U-boats decimated coastal shipping, the United States was determined to complete the Intracoastal Waterway in 1936, making inside passage between New Jersey and Florida a reality.

George Washington had surveyed a proposed canal through the Dismal Swamp in 1755, though he did not consider a canal feasible. The original purpose was for rafting lumber, but a later incentive for undertaking the 22-mile canal was military — although colonial troops under Washington had received important supplies smuggled past the English blockade through Ocracoke Inlet, there was difficulty in transshipment north to encampments such as Valley Forge. Construction did not begin until 1790, but the hand-dug canal was open to flatboat navigation in 1805, and enlarged by 1826 for shoal-draft ships, the first being the 65-foot schooner *Rebecca Edwards* which squeezed through the 75-foot by 9-foot locks with freight for Norfolk. The completion enabled shipping to avoid many of the perils presented by Capes Hatteras and Lookout, using an inside route from Cape May, New Jersey, to Swansboro, North Carolina.

Actually, North Carolina was a pre-colonial participant in the waterway concept, Indians already having created a 10- to 12-mile haul-over for their dugouts across lowland and marsh between the Neuse and Newport rivers. Colonists came upon it and, using mules, slaves, contract and indentured labor, deepened it to 5 feet, reducing by 70 to 80 miles the distance between the Swiss settlement of New Bern and the plantation landing known as Beaufort.

Still called the Old Indian Canal, though shown on charts as the Clubfoot or Harlowe Canal, this was the major freight route for 150 years before the Corps of Engineers opened the Adams-Core Creek Canal of the Intracoastal in the 1930s. At low tide the old route is now only about 6 inches deep; a good high tide adds another 18 inches.

The few roads in colonial days were at best a mix of deep mud and logs, and coastal railroads did not come until the 1850s. We can only try to visualize men and mules leaning into tow lines, while yellow flies and mosquitoes buzzed them mercilessly as they trudged a well-worn path alongside the canal, dragging barges typically about 40 feet long, 6 or 8 feet wide, and fully loaded with barrels of fresh whale oil, salt mullet, tar in kegs, baled cypress shingles and bags of grain.

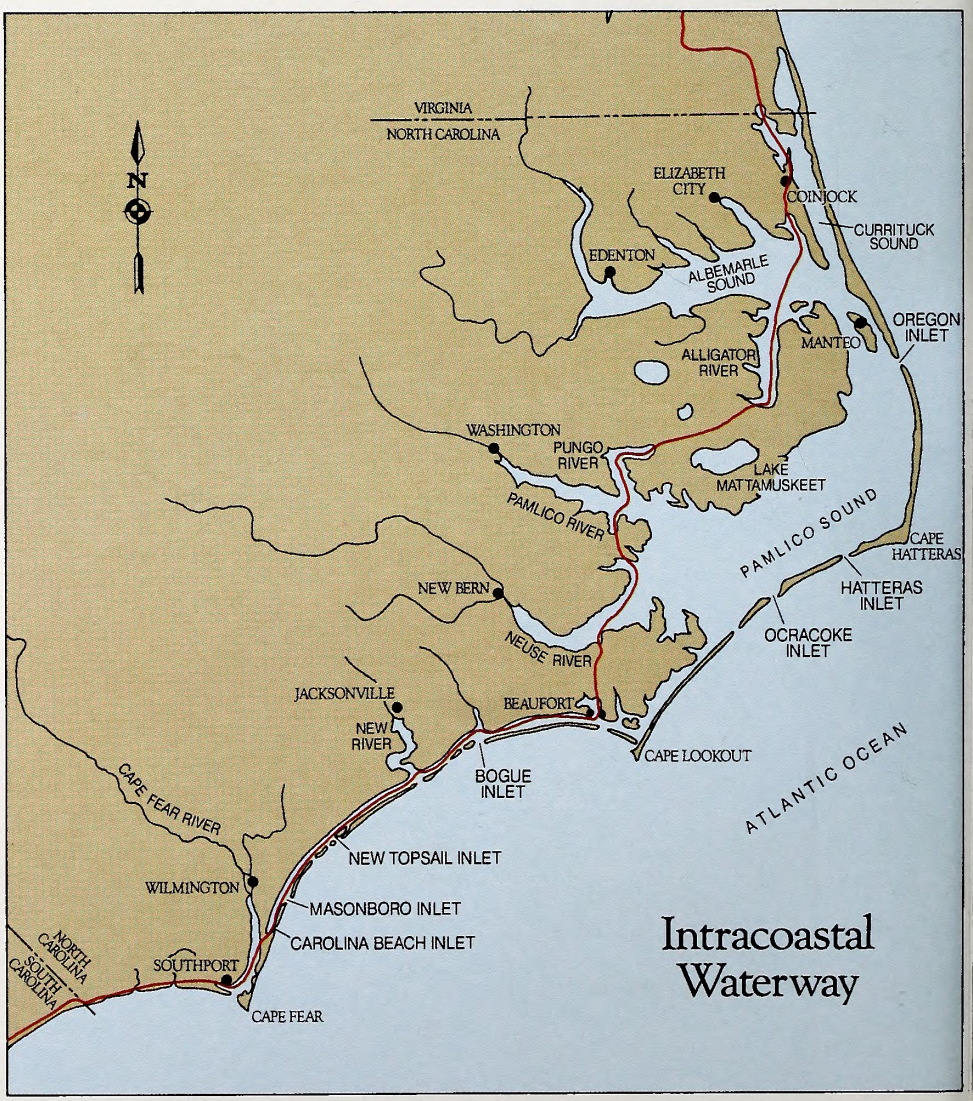
It is documented that the first iron boat in America was *Codorus*, a 60-foot steamer built in New York. When the Dismal Swamp Canal was fully opened for traffic in 1828, *Codorus* was logged as the second boat through, bound for the Slave Canal.

To most boatmen, the true Intracoastal Waterway starts at Hospital Point, Norfolk, Virginia where the Corps of Engineers erected a flashing red marker, Milepost 0. About 25 miles south "The Ditch" enters North Carolina. At Deep Creek boats are locked up 12 feet to the pocosin level of the Dismal Swamp.

Sunlight through the wash of a boat gives the canal water a luminescence. Colored and flavored with maple, cypress, gum and juniper, it is a rich golden brown. This juniper water remained sweet on the long voyages of old sailing ships, and juniper tea was favored by swamp lumberjacks because it offered immunity against malaria.

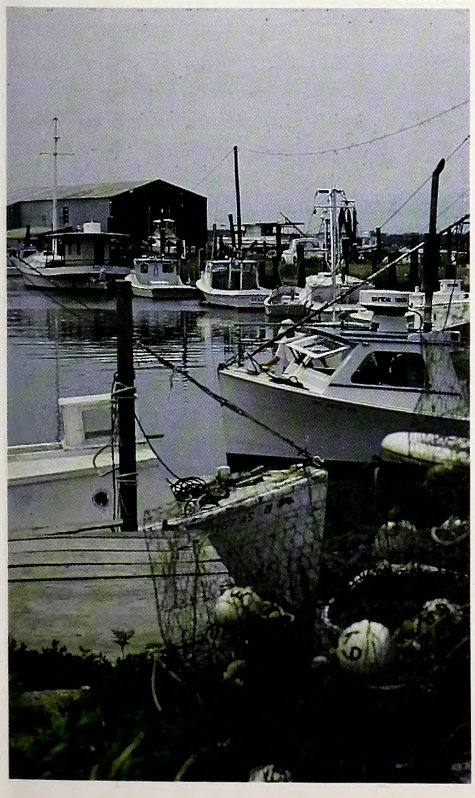
At South Mills lock boats are lowered into the upper Pasquotank River, an area of dense forest, abundant wildlife and deep swamp. Elizabeth City lies where the river widens, a city known for its lumbering and shipbuilding ever since a group of Bermudians began building ships on the banks of the Pasquotank in 1666.

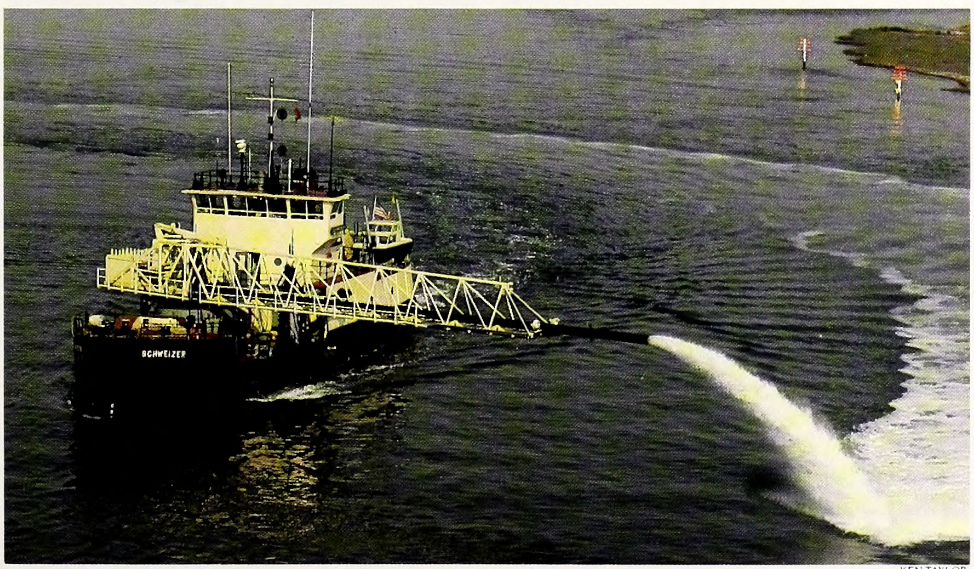
"Sunlight through the wash of a boat gives the canal water a luminescence. Colored and flavored with maple, cypress, gum and juniper, it is a rich golden brown."



KEN TAYLOR

BOB SIMPSON





KEN TAYLOR

Small craft take *advantage of the continuous nature of the inland waterway. Marinas up and down the North Carolina coast do a fine business with sail- and motor-powered boats seeking provisions and an evening's shelter.*

Dredging vessel plies *a lonely beat in an inlet near the Waterway. North Carolina's section of the Intracoastal Waterway consists of natural waters and dredged canals.*

BOB SIMPSON

Fishing boats remind *passersby of the ancient fishing traditions of the Carolina coast. Small shrimpers and other fishing boats use the Waterway for easy passage to the sounds and other favored fishing grounds.*

THE BIG DITCH

Here, on Water Street, Elizabeth Tooley ran a grog shop, catering to the Dismal Swamp shingle gatherers. She acted as a fence for slaves and stolen goods on the side. One bitter night Edward Scarborough of Kinnakeet sailed his bugeye to market from Hatteras Island with his year's crop of baled yaupon leaves, from which Carolina tea is made.

Entering the grog house, he was greeted by a drunken cry of "Kinnakeeters! Yaupon eaters!" Scarborough failed to see the humor of the remark and cleaned house. To this day any native of Kinnakeet, now Avon, will respond to this battle cry, and to this day the moral is, Don't mess with a Hatterasman.

In 1859 another canal opened a few miles out of Norfolk at Great Bridge, Virginia, the Albemarle and Chesapeake, popularly called the Virginia Cut. It opens onto the headwaters of North Landing River, giving entry to Currituck Sound. Both routes converge eight miles south of Wade Point Light at the mouth of the Pasquotank. Here the waterway makes an open water crossing 14 miles across Albemarle Sound.

Rivers flowing into the Albemarle offer fascinating cruising. The Perquimans is navigable as far as Hertford while on the Chowan and its tributaries, a boat can cruise past Edenton and another 45 miles north, almost to the Virginia line. Another tributary is the Roanoke, navigable west for around 30 miles. These waters include a vastness of lonely sounds and rivers, cypress forests and swamp country almost beyond comprehension. Brown water sliding by, cresting in white-tipped waves, crab pot floats lifting and dipping, a few gulls wheeling, scouting.

The waterway has connected such existing natural sounds, bays and rivers so that a cruise may take the boatman from a fully sheltered passage into the sometimes rampaging waters of open bays and large sounds like those found in North Carolina. These shallow sounds, rarely more than 20 feet, can make up quickly from millpond calm to confused seas, short, steep and mean, scarcely permitting a small boat to recover from one sea before another hits. To be caught in a northeaster here is particularly unpleasant.

An old Core Sounder once offered this advice: "When she blows, get in the lee of a pine tree." Lacking a pine tree, put the boat deep in the marsh, for these inland seas are formidable. There was a time, though, when we forgot this adage. We were on a spring cruise north aboard *Sylvia II*, our old Core Sounder, under clear skies and light winds when we paused for the night and anchored in a semi-protected anchorage off the Albemarle.

By supper time some scattered thunderstorms had appeared on the horizon, and the once-moderate southwester was freshening.

KEN TAYLOR

***Derelict fishing boat** lists in a backwater near the Waterway. The U.S. Army Corps of Engineers maintains the Intracoastal Waterway. The first official work on the North Carolina section of the Waterway was completed between 1836 and 1838.*

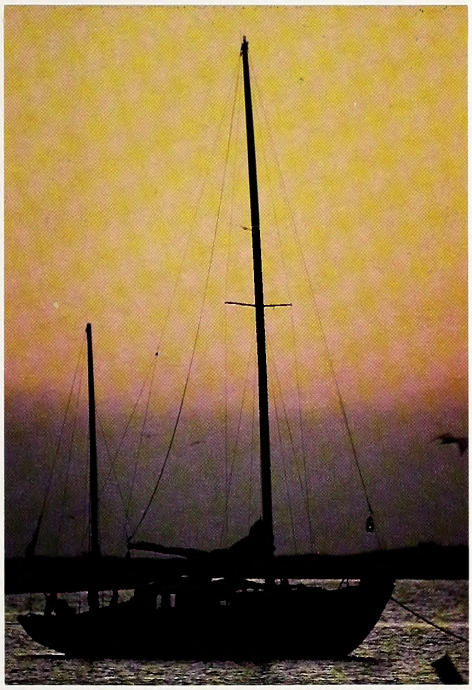
"Rivers flowing into the Albemarle offer fascinating cruising . . . . These waters include a vastness of lonely sounds and rivers, cypress forests and swamp country almost beyond comprehension."

We turned in, only to be awakened hours before dawn when the wind switched northeast. The howling in the rigging soon rose to a shriek and spray was flying. We checked the anchor for security and the line for chafing. Our 55-year-old boat was leaping, plunging, twisting on enormous waves that rushed toward us white-topped and black, and crashed against the hull in a bedlam of sounds.

By hanging on with arms and legs it was possible to stay in the bunk. The slamming, hissing, thudding of seas gone wild and the scream of the wind increased. Astern, in the half light of pre-dawn, a 35-footer was plunging, rearing, then falling back, dipping her pulpit into the seas, lifting and shaking streaming water from her deck. At times we could see at least half her bottom exposed.

Our anchor held, though the line was twanging like a banjo string. Near first light the wind slackened to a small gale. By the time the sky was bright, tattered clouds were speeding along the horizon and ashore the jagged stumps and snags of the great cypress swamp were white with foam.

It was some hours before the wind died sufficiently for us to resume our trip, but we had relearned that Albemarle Sound, Pamlico Sound and the Neuse River have earned their reputation for being among the East Coast's roughest inland waters.



KEN TAYLOR

***Travelers along the** waterway frequently anchor in adjacent bays or sounds. It may be the last bargain in overnight accommodations.*

Connecting Albemarle and Pamlico, the Alligator-Pungo canal is a land cut of 22 miles that links the Alligator River to the Pungo River a few miles from good harbor in Belhaven. It is a short cruise south across the Pamlico River (easily navigable to Washington) into Goose Creek and the cut past Hobucken into Gale Creek and Bay River, thence around Maw Point on Pamlico Sound and into the mouth of the Neuse River. This is the last of the exposed waters, and only a short distance to Oriental on the north shore of the Neuse, a snug harbor. (Thirty-five miles upriver at the confluence of Neuse and Trent rivers is New Bern.) The Waterway continues to Adams Creek on the south shore of the Neuse and enters the Core Creek Canal leading to the Newport River, with Beaufort to the east and Morehead City to the west.

Though pleasure boat usage is noticeably on the increase — more than 10,000 recreational craft pass through these waters each year — the Corps of Engineers measures Waterway usage by the commercial tonnage reported. It reports that in 1985 slightly more than 3,000 commercial trips transported 1.75 million tons. This tonnage is down by nearly 50 percent from eight years before.

It is not unusual on the Waterway to see sailboats — some bearing foreign flags — small freighters, inland cruise ships, sportsfishermen, plush yachts, even an occasional paddle wheeler. This liquid highway is so cosmopolitan that a Chinese junk, a floating hotel, or a kayak may be seen cruising the same waters as huge barges laden with cargo ranging from sand and gravel to space shuttles. The Waterway is especially important to fishermen, providing easy passage to the fishing grounds for small shrimpers, trawlers, crabbers, oyster boats, and menhaden boats.

North Carolina waterways are awash with history, romance, intrigue and violence. They have been host to pirates, major battles of the Civil War, blockades and German U-

THE BIG DITCH

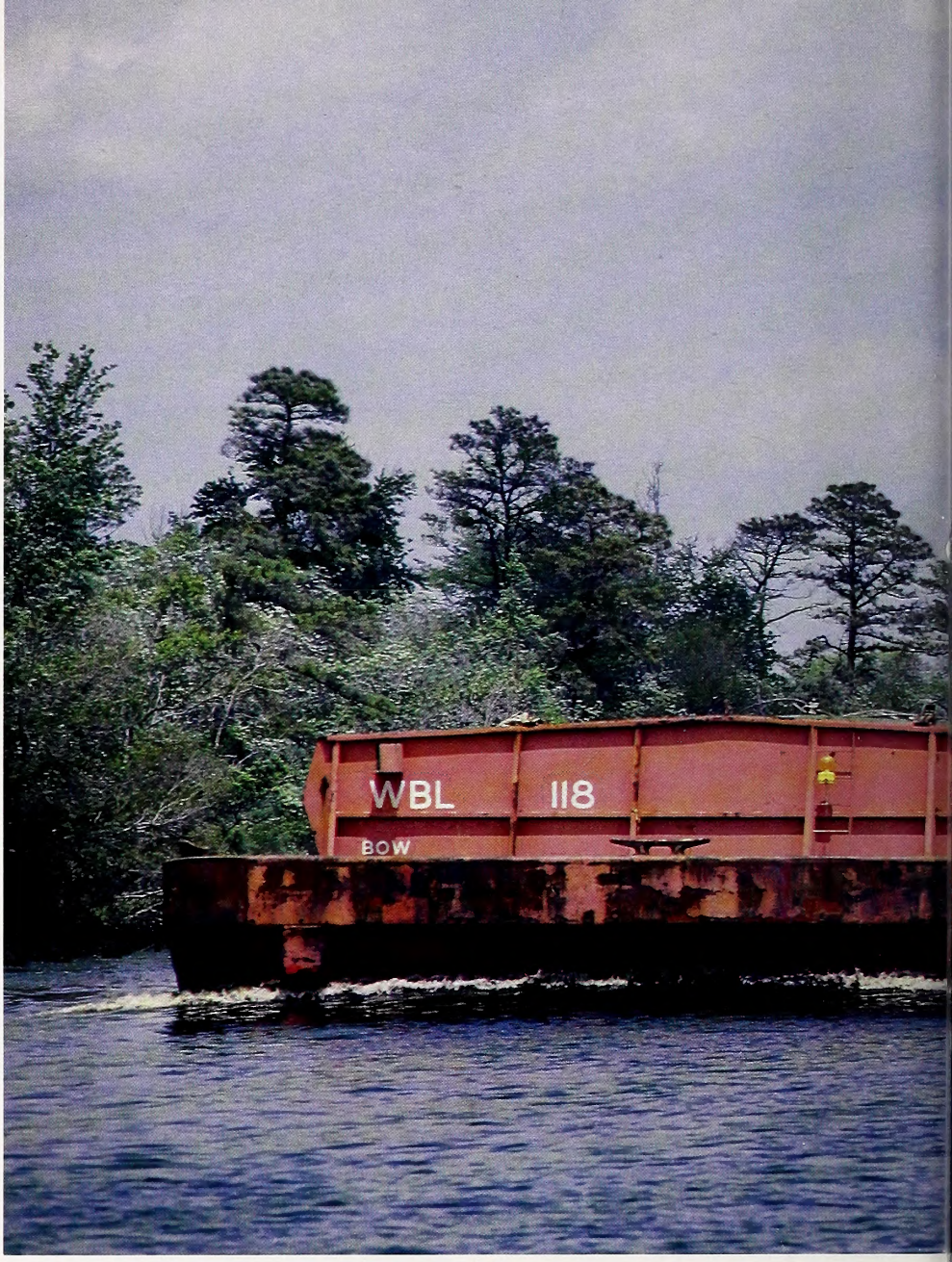
boats up through World War II, all part of a colorful coastal history.

On a cold morning this past winter, I pursued another means of Intracoastal Waterway travel by signing aboard the 95-foot tug *Roleta* at Morehead City, a little more than halfway along the North Carolina section of the Ditch. She was southbound, pushing nearly 500 feet of steel barges. Capt. Tom Kellum of Morehead City explained that a single barge carries as much as 72 tractor trailers, the usual tow of two barges equivalent to the capacity of 144 18-wheelers each trip.

The wheelhouse afforded a panoramic view from some 30 feet above the water. Encased in thick ice on the Delaware River, the *Roleta* was shedding the last of it as we passed beneath the Atlantic Beach bridge that spans Bogue Sound, a narrow, shallow passage about the size of the Sea of Galilee. Experienced waterway users consider the Neuse River the break line from ice to ice-free waters.

Strong tidal effects influence the Newport River estuary. *Roleta* had been fairly flying on an ebb tide, but was abruptly bucking it as soon as she rounded the port terminal into Bogue Sound. By planning his arrival at Beaufort Inlet near the last of the flood, the operator of a slow boat can ride the tide from Core Creek down the Newport. As the tide changes he will then have a boost from the last of flood from Beaufort Inlet and the first of the ebb for the rest of the 25 miles to Swansboro and Bogue Inlet. Strong cross currents occur wherever coastal rivers exit an inlet. It was sundown as we passed moored boats where the White Oak River meets the inlet.

Roleta runs 24 hours a day, using a double crew, 6 hours to a watch, for a two-week stint. Seven men make up the crew: two deckhands, two engineers, the mate, the captain and one cook, the cook on split shifts. It was lonely topside in the darkened wheelhouse as tug and barges bumped their way over several shoals. Colors faded, blackness



BOB SIMPSON

***Mate James Carwin** steers the tugboat* Roleta *toward the Atlantic Beach high bridge. Commercial tows like this run 24 hours a day, using double crews to man the watches. A single barge can carry as many as 72 tractor trailers.*

BOB SIMPSON

***A Willis Line** tug on a run between Philadelphia and Jacksonville, Florida, on Core Creek Canal connecting the Neuse and Newport rivers. Barges like this one make up the bulk of the Waterway's commercial tonnage.*

***Rouged by the** setting sun, sea gulls escort all vessels on their protected passage through North Carolina's Intracoastal Waterway.*

LAWRENCE S. EARLEY

"This liquid highway is so cosmopolitan that a Chinese junk, a floating hotel, or a kayak may be seen cruising the same waters as huge barges laden with cargo."

filled the voids. The waters ahead, wrapped in the gloom, gleamed silver and gray. The giant spotlight beamed ahead, probing for channel markers.

In the galley, below and aft, cook Joe Wabbleton was cleaning up after supper. The coffee pot is always on, and sandwich materials in the refrigerator. A good cook is as important as a good skipper to ensure a happy crew. *Roleta* enjoys all three.

Beyond New River the oceanside was an endless jumble of summer homes clinging to a low beach. In Masonboro Sound the fog blocked visibility beyond the forward barge. Emerging from Snows Cut, we could see the markers and tops of islands. Small boats busy oystering the Cape Fear River were a hazard, so *Roleta* paused long enough for the fog to lift before making the turn at Oak Island past Southport toward Lockwoods Folly Inlet. The Cape Fear, said to have been called the Jordan in the late 16th century, has been fairly well documented as the waterway where shipbuilding first occurred in what is now the United States.

We were nearing the South Carolina line, and it was time to jump ship, at Mile 347. Capt. Tom radioed the bridge tender at Sunset Beach asking permission to put a party ashore. The tender consented, and the skipper eased the several thousand tons of steel and cargo so gently alongside the fender system that he wouldn't have cracked an egg. The bridge at Sunset Beach, a floating barge operated by cables, is the last pontoon bridge spanning the waterway. Ashore, Danny Hewett, fisherman-farmer and 17 years a bridge tender, volunteered that more than 2,000 boats passed through the opening during the peak waterway month of October, mostly pleasure boats heading for warmer climates.

Behind me lay many miles of the Big Ditch; ahead, I could see the shining water beckoning toward the Gulf of Mexico — an investment begun by the Indians and still being improved. It has saved millions in losses, thousands of lives, and proved an economic boon not only to North Carolina, but the nation.

For travelers like me, it is both education and adventure. As I waited for my ride, it seemed only appropriate to recall a Latvian seaman's toast, "May there always be at least this much water under your keel." ⊠

SELECTIVE SMALLMOUTHS

Smallmouth bass are great sport on topwater, but you'll catch more fish if you know their habits and match their natural foods.

by Harry Murray

It's a game worth learning. At least, that's my assessment of the sport of fishing for smallmouth bass with a flyrod. Actually, it might be more accurate to call it an obsession, especially if you catch those smallmouths on topwater bugs.

Contrary to popular belief, it's not difficult, and I'm convinced it's one of the most productive techniques you can use if you follow a few logical steps. First, it's important to learn to analyze the water conditions and available food, and know how the bass adapt to these. Then you can match your tactics to these changing conditions as the season progresses.

In North Carolina, good surface fishing for smallmouth can usually be expected by May. Water temperatures in our lakes are now close to their peak for smallmouth to feed in the shallows along the shore and around islands. Also, streams have dropped to more or less normal levels, and bass are surface feeding.

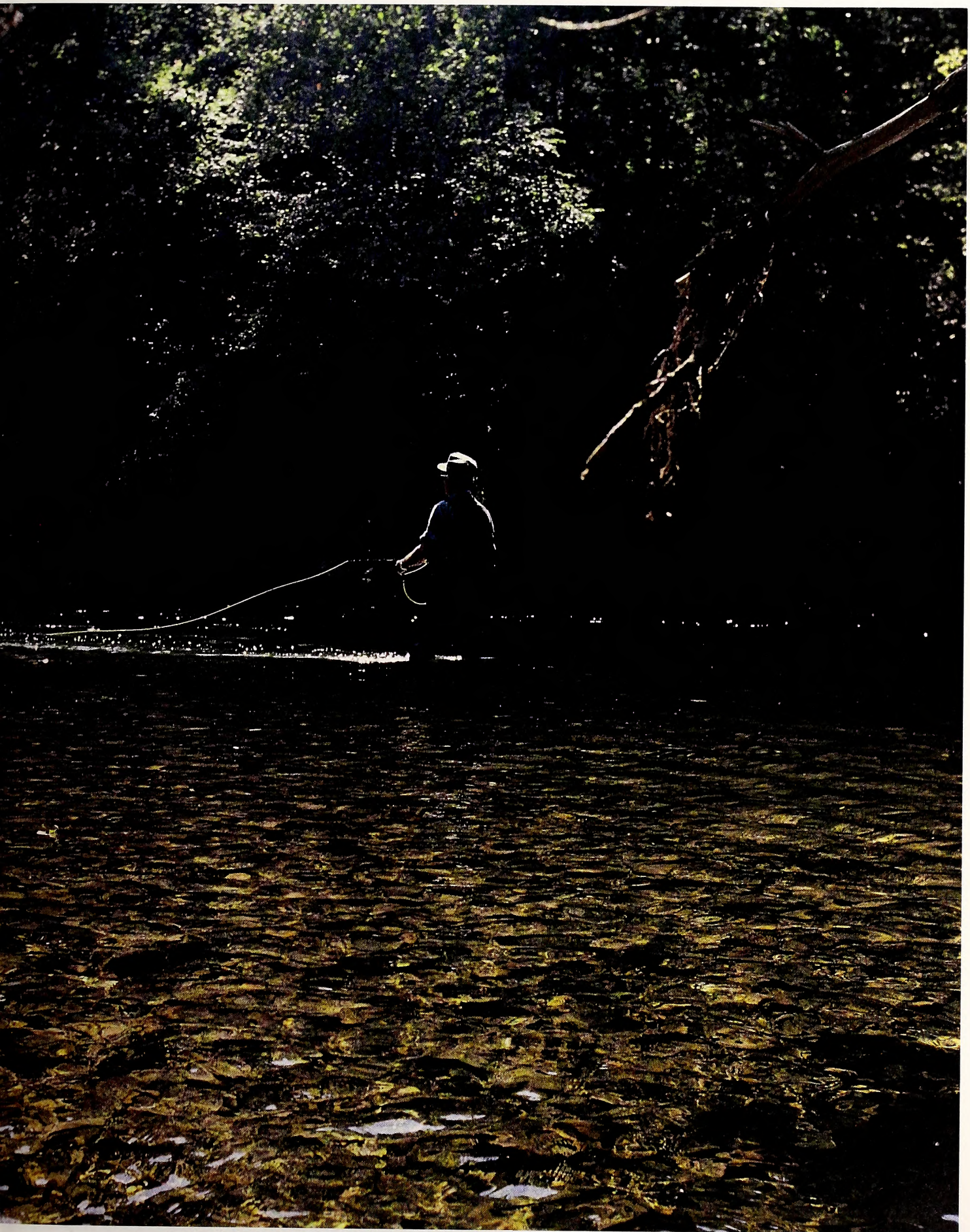
Hard head bugs — often simply called "poppers" — are exceptionally productive this time of the year. There are many styles of these bugs, and each can be made to produce different actions. The true cupped-faced popper is ideal now since streams are bank full, and it is often necessary to produce a fair amount of commotion with our bugs to get the attention of a bass. However, it is always wise to experiment. Try a variety of bug actions on different days and on different waters.

A system I use to determine just which action the bass find most appealing is to work the bug several different ways on the same cast. Dropping my bug in close to the bank, I let it lie motionless for up to a minute (unless the water is flowing too swiftly) before moving it. Then I retrieve it gently several inches and allow it to sit again for about a minute. If this does not produce a strike I work only the line to produce a gentle jiggling action of the popper with a minimum of forward movement, then allow it to lie motionless again. If this still has not enticed a bass, I impart an easy sliding action to the bug by pulling on the line — it's called stripping the line. I make two consecutive 6-inch "strips." Again, I allow the bug to lie motionless for a short period. If all of this fails, I use my line hand and strip it in quickly in two foot-long jerks. The idea is to make as much commotion as possible with the bug.

There is, I think, sound logic behind this system. The water close to the bank is usually fairly shallow, and a bug worked loudly here would scare the fins off the fish. The water farther from the bank is normally deeper and a loud manipulation of the bug

HARRY W. MURRAY

***A fly fisherman** wades a riffle, casting a floating deer-hair bug close to the shaded banks where smallmouth bass frequently lie waiting for something edible to fall into the water.*



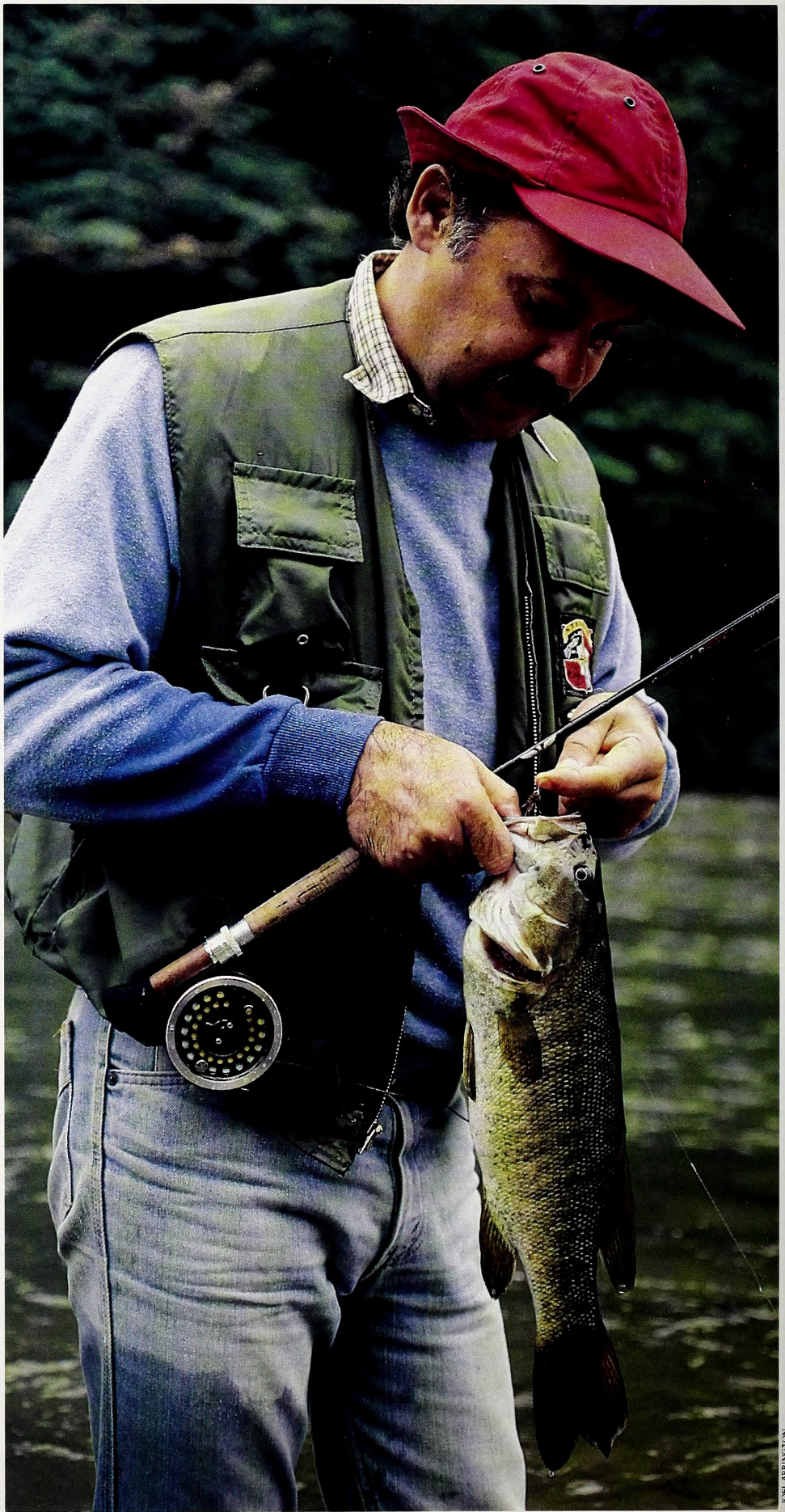
here may actually be very appealing to the bass. The answer is to keep experimenting until you find what they want.

At this time of the year it is quite common to find smallmouth chasing minnows in the shallows of both lakes and streams. The skipping bug is an excellent pattern to use in these situations. Its streamlined shape enables you to cast it quickly and easily in front of a feeding bass, and its up-sloping face allows you to skip it on the surface and create lots of commotion.

These "chase" situations produce exciting action and some of the largest smallmouths. In most cases, the tipoff to use a skipping bug is signaled by the disturbance the minnows make on the surface as they flee to avoid an oncoming bass. Since we seldom see the actual bass in these situations, we must estimate his location and route by the action of the minnows. Just remember that wherever minnows go, bass will follow.

I get my best results by casting my skipping bug about 3 feet ahead, and 3 feet beyond, the racing minnows. The instant my bug touches the water I bring it to life with a rapid line hand stripping action so that the bug passes right through the school of minnows. My hope is that this loud action will attract attention, and it usually does. A bug worked right in front of the bass often presents a more tempting target than the minnows running away from him. I have found that if my first cast does not bring a strike and the bass stops chasing minnows, it is advisable to try only one or two more casts into that area. Continuing to pound the water will usually spook the smallmouth. It is better to stop casting and wait until the bass shows up again. This normally occurs in less than a minute. This time you are ready for him, and can quickly get your bug on target. Skipping bugs have been used successfully for years in saltwater, but a smaller size is better for smallmouth. I get my best results with a size 4 skipping bug with a blue and white or red and white body.

If you like fishing dry flies for trout, but have never used them for smallmouths, there is a situation that occurs in May on many of our streams you don't want to miss. I'm talking about the fly hatches. There are several species of large mayflies that may hatch on some streams in sufficient numbers to attract bass — one of these species being the brown drake. Since the smallmouth are not likely to examine the floating naturals



JOEL ARRINGTON

***Most smallmouths caught** in North Carolina's streams average a foot-long or less, but there are almost always bigger fish around. One this size is great sport on a flyrod.*

with magnifying glasses, we'll just call them all the brown "drake" hatch and let it go at that. A size 8 irresistible dry fly is an outstanding choice for smallmouth when these flies are hatching.

There are several ways to fish these mayfly hatches. When the duns first emerge from the nymph form they ride along the surface of the stream for considerable distances presenting an easy target for the smallmouth. At this time some bass take up a specific feeding station close to the natural line of drifting insects and pick them off as the current brings them past. A fixed feeder is often an easy fish to catch because you know exactly where he is. Once I spot one of these feeders I like to move in about 30 feet below him and slightly to one side, then cast my fly about 3 feet above him and let the current bring it to him just like a natural insect. This is a lot of fun and very productive.

Late in the evening the brown drakes which emerged the day before return to the stream to mate and deposit their eggs. Once this is completed the mayflies fall to the water and die. At this stage we refer to them as spinners. Fishing the spinner fall can be even faster than it is on the emerging duns because of the thick concentrations of spent spinners that fall on the surface in a relatively short time.

Some smallmouth select specific feeding stations and feed on the spinners in much the same way they did the duns; however, many of the bass are greedy when there are many spinners on the surface and these bass prefer to cruise. It is easy to become unnerved as a dozen smallmouth are sipping natural flies all around you, especially if you cannot get a strike. The solution may lie in getting your fly to the right place at the right time. By carefully watching the rises, you can establish a fish's cruising and feeding path. Once this is determined you simply make an educated guess on his direction, and put the fly ahead of him. Another tactic that works on these cruisers is what I call "hitting them on the head." The instant a bass rises to take a natural insect the fly is quickly cast to that exact spot. At least for a split second, you know exactly where that bass is, and he may take your fly.

This time of the year also presents ideal conditions for finding lots of mice and frogs along the banks and around aquatic grass beds. A deer hair kicking frog or deer hair mouse in size 4 will take lots of nice smallmouth, especially if you fish them close to the cover where the real McCoys live, and make them duplicate the movements of the naturals. In the case of the frogs, impart a kick-glide-kick retrieve. The mouse is best retrieved steadily.

From the latter part of May through the summer, you may find concentrations of damselflies around aquatic grass beds and brush piles in streams. This sets up some of my favorite smallmouth angling. Using Whitlock's deer hair gerbubble bug or Murray's dancing damsel in size 6, I carefully fish the edges of the grass beds. I like to wade about 40 to 50 feet out from the edge of the grass beds and slightly upstream of them. This allows me to methodically fish the whole edge of the grass bed as I wade downstream. I cast my fly right against the grass and slowly strip it out in a dart-pause-dart retrieve for about 10 feet, and then pick it up and cast it about 3 feet farther downstream, but still tight against the grass. Since the very edge is the hot spot I am in no hurry to quickly work my fly out of that area. Likewise, I see little advantage in fishing the fly all the way back to me over open water.

HARRY W. MURRAY

***These are some** of the author's favorite floating patterns for smallmouth. Top, left to right, dry damselfly, deer-hair mouse, deer-hair frog, deer-hair gerbubble bug, cup-faced popper, and crawl 'n twitch popper. Bottom, left to right, irresistible dry fly, light caddis buck, bass improved golden stone dry, and improved sofa pillow dry.*

The dragonfly is another large insect which is present on many smallmouth streams. They are seldom as plentiful as the damselflies and they are such strong fliers that the bass actually capture very few of them. However, this doesn't keep them from trying and their leaping attempts to grab these dragonflies in flight tempted me to experiment one day when things were going slowly. Remembering Ed Hewitt's work with long-hackled dry flies called skaters while fishing for trout on the Neversink River in New York, I decided to experiment by skating some heavily-hackled flies in bass sizes. By greasing both the fly and the leader liberally with silicone cream, I was able to bounce and skate the fly across the surface in what must have been an appealing manner.

The technique is to fish down and across the stream with no more than 30- to 40-feet of line. The instant the fly touches the water I raise the rod tip high in front of me at about a 45 degree angle, and strip in all of the slack with my line hand. With the fly up on its toes, I begin a stiff-armed sweeping action with the rod that causes the big skater to dance across the surface in foot-long spurts. The pockets between ledges and the tails of the pools are the most productive areas for this skating technique. The best flies I have found to skate are the bass improved sofa pillow, bass golden stone, and light caddis buck, all heavily-hackled in sizes 6 and 8. However, most any bushy, high-floating dry will work.

The best fly rods for smallmouth bass in most waters will range from 8½- to 9½-feet long, and handle size 7 or 8 fly lines. Graphite rods are certainly an advantage because they're light, yet powerful. I've found that the rods that give the anglers the most problems are those with delicate tips. A fly rod designed to present a size 14 dry fly delicately will seldom do a good job of delivering a big size 4 popper, even though it might be designed for a size 7 line. Therefore, try to avoid rods that have tips that seem too delicate.

Most smallmouth anglers prefer single action fly reels that are large enough to hold the appropriate fly line and about 100 feet of 20-pound test dacron backing. Choose a floating fly line, preferably a weight-forward style.

Your choice of leader is extremely important for efficient bug fishing. It should be at least 9-feet long and tapered from a fairly stiff 6-foot butt section down through several short sections to a 2-foot tippet. Don't choose a tippet too light or it will not cast the fairly large bass bugs adequately. A tippet testing less than about 8 pounds may be too light unless you're using a dry fly.

If you are looking for some exciting fishing, you simply must try surface fly fishing for smallmouth bass. If you catch bass — and you should — you'll keep coming back. ⊠

Corridors Of GREEN

They're called greenways — urban parks that border creeks and rivers — and they present a nearly ideal solution for cities seeking flood plain protection and quiet places for people and wildlife.

by Jane Rohling

A few years ago, while living in south Raleigh, I used to go to a small patch of woods at the end of my street to lose the tensions of the day. Then the beltline brought "prosperity" to that part of town and today apartment complexes are springing up where trees once grew. Now, from my home in Chatham County, I occasionally hear chain saws buzzing in nearby woods, eating away at my neighborhood refuge again. Soon the saws will be replaced by bulldozers, clearing the way for more roads, more homes, more people.

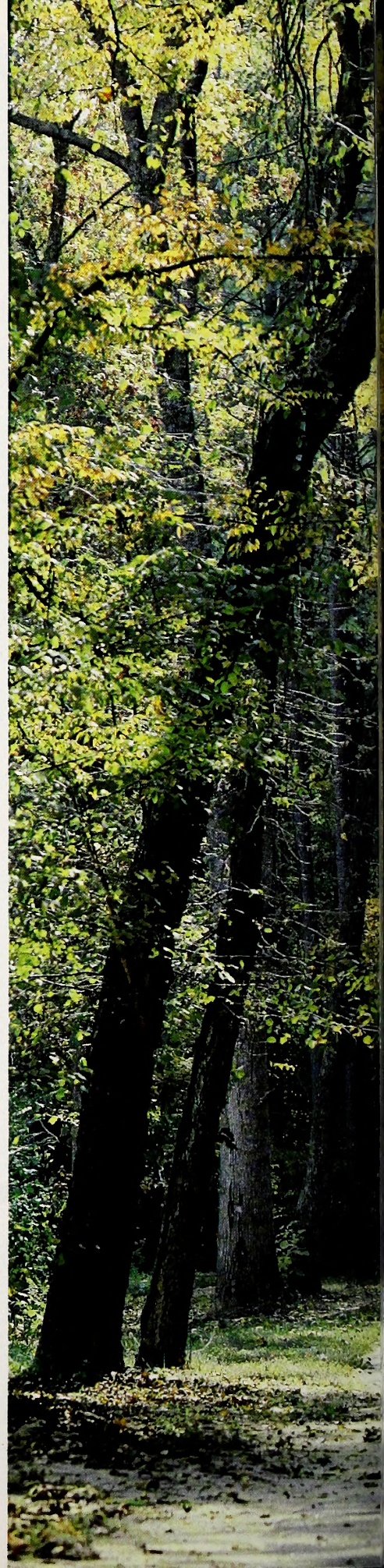
That's the way it's been going in the Research Triangle lately. Everywhere you look, urbanization is swallowing up fields and forests. Of course the Triangle is not the only area where this is happening. Across the state most North Carolinians are seeing open spaces disappear with depressing regularity.

But in some communities, people are doing more than just complaining. They're rallying to preserve open space, and the tools they're using are greenways. Indeed, for many in North Carolina, greenways are clearly an idea whose time has come.

Greenways have been described as linear parks within towns and cities. These parks are usually found along flood-prone rivers and streams, often the only undeveloped land left within cities. When trails are constructed through these parcels, however, they become popular recreation areas for walking, jogging or even bicycling. They also provide linkage between neighborhoods and public areas such as schools or shopping centers, and even help maintain wildlife habitat and unique natural areas.

While there are examples of urban open space planning dating as far back as the thirteenth century B.C., the concept of linear greenways was first introduced in the mid-1800s by American landscape architect Frederick Law Olmstead, who designed New York's Central Park and the gardens at Asheville's Biltmore estate. The idea has been used extensively in America and Europe. In North Carolina, most greenway programs have started within the last 20 years or so, but plans for the cities of Durham and High Point mentioned greenways as early as the 1920s.

Raleigh was the first city in the state to begin greenway planning in a big way. The 1951 Land Development Plan suggested public corridors along the city's streams, but the greenway concept didn't really take hold



MELISSA McGAW

***Joggers enjoy a** run along a portion of the 27-mile Capital Greenway system in Raleigh. Walking, bicycling and bird-watching are other popular greenway activities.*

until the early 1970s when rapid urban development and flooding problems at the environmentally controversial Crabtree Valley Mall drew attention to both the social and ecological need to protect urban open space.

A citizens' group called Wake Environment and the local Sierra Club group successfully lobbied the city council, convincing it to fund landscape architect Bill Flournoy's study, *Capital City Greenway.* Completed in 1972, this became the blueprint for the state's oldest and largest greenway system — acquiring over 800 acres of land, and including 27 miles of trails.

Another landscape architect, Chuck Flink, was Raleigh's greenway planner from 1984-86. He is currently president of the Triangle Greenways Council and operates Greenways, Inc., a Raleigh-based consulting and design firm. "The greenway concept has spread across the state to almost every major municipality," he said. "I think that one of the things that's impressive is that the energy is coming from the citizens rather than the government units."

What makes this idea so popular? What benefits can a city derive from the preservation of open space?

One basic advantage is that open space makes city life more pleasant. These natural corridors can direct urban growth, acting as a buffer between incompatible land uses. A greenway, for example, can serve as a screen between a residential and industrial area. An interconnecting system of greenways also creates an opportunity for non-motorized travel, such as bicycling, within the city.

The environmental benefits of greenways are also numerous. First, forest and shade trees remove substantial amounts of air pollutants from our atmosphere. Also, trees help cool cities, which retain large amounts of heat in roadways and buildings. In addition, greenways absorb sound from busy roads and industrial areas, reducing noise pollution.

Perhaps the greatest benefits of greenways, however, are related to the protection of flood plains and water quality. Development in flood plains is expensive, both economically and environmentally. If a flood plain is developed, millions of dollars may be needed to offset flooding damages to property or to construct flood-control structures such as dams and dikes. If these areas are left alone, they can be used for recreation and help beautify the city. Occasional flooding

" 'One of the arguments for greenways is that we don't have enough land left in our park patches for some wildlife species. Yet, if we could connect the patches by means of green corridors we may have enough.' "

of these areas does little damage to hiking trails. Also, leaving a natural buffer of forest helps filter out the pollutants which wash off our city streets before they reach our rivers and streams, and also reduces downstream flooding.

And what about wildlife? Urbanization and changing agricultural practices have hurt some species. Yet, the general impression that once an area is urbanized or developed it loses its value as wildlife habitat is not necessarily true. In fact, since there are more mature trees in some urban areas than in the surrounding countryside, it's not surprising that populations of adaptable species like squirrels, raccoons, opossums and many songbirds may be higher there, too. Greenways may also serve as travel corridors for wildlife.

"One of the arguments for greenways is that we don't have enough land left in our little pockets and patches for some wildlife species," said Annette Liggett, Wake County's greenway planner. "Yet, if we could connect the patches, we may have enough. The question is, how wide a corridor do we need?"

Unfortunately, very little research has been done to answer that question, but figures ranging from 150 to 500 feet have been suggested.

With so many reasons to develop greenways, it's hard to imagine why everybody isn't doing it. But, as with most things, there can be a few snags. Land acquisition is often one of them.

Methods of acquiring land differ with each program. Some prefer fee-simple ownership, either through donation or purchase. Others ask for public access easements or combine greenways with utility right-of-ways, especially along sewer lines.

Purchasing lands can require a sizable fund-raising effort. Mecklenburg County has probably been the most successful of all counties at raising funds for greenway acquisition. In the past 10 years, the citizens of the county have passed bond referendums totaling $6.6 million for greenway development and land acquisition. Ironically, so much land has been donated that the county has not had to spend the money as quickly as anticipated. Utility companies and developers have even built trails for the greenway.

Perhaps the most creative fund-raising effort belongs to the Greenways Task Force in High Point. This fledgling group is "selling" 1-foot sections of the greenway. For a $25 contribution, you receive a 1-by-1-foot box that contains a "deed" indicating exactly which foot of greenway belongs to you.

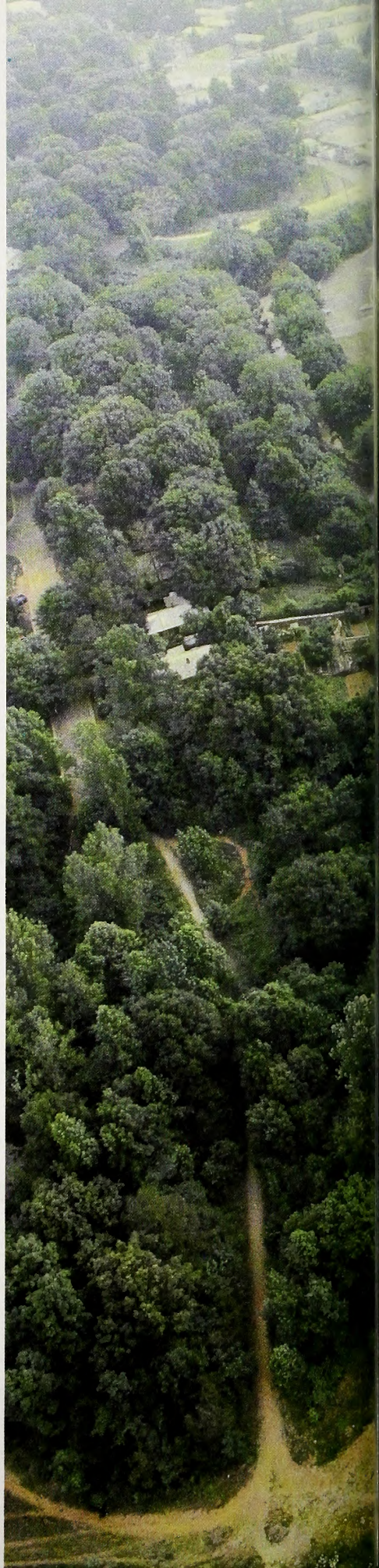
No matter how successful a county is in raising money for greenway acquisition, it's never easy to convince residents to part with a piece of their back yards. This is hardest in older, established neighborhoods where negotiations with multiple landowners are necessary to secure a stretch of greenway. The strongest incentive for private landowners to donate land is probably the tax credits available to them.

In undeveloped urban areas the process is generally less complicated. Most municipalities have several tools available to them — zoning restrictions on floodplain development; ordinances that require developers to dedicate a portion of their land for recreation; or "user fees" required of developers to help pay for the recreational and open space demands their projects create. In most cases, developers have been very cooperative, and with good reason. Preserving trees and providing open space can increase the value of new homes by 15 to 20 percent.

Another incentive for developers is the possibility of receiving density credits for open space within planned developments. This gives them more units to sell in a smaller area, reducing construction and service costs.

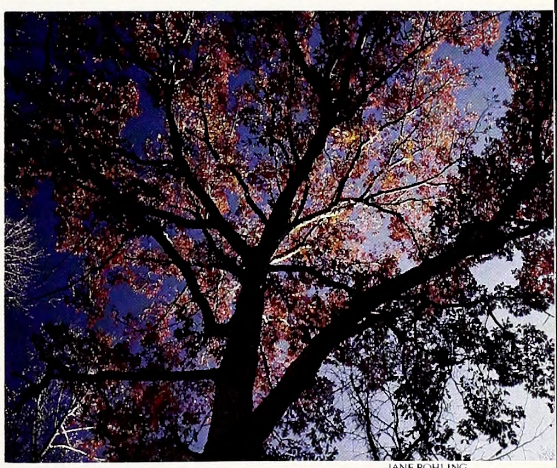
Unfortunately, it's difficult to convince public officials in more rural areas that setting aside land now for the future is a good idea. Flink, reflecting on the problem, said, "I think that the citizens of the Research Triangle area and Mecklenburg County for obvious reasons feel more threatened about their open space. So, they're going to move more quickly to establish greenways than municipalities that don't have much urbanization."

David Bland, of the Triangle Land Conservancy, echoed these sentiments at last year's Greenway Conference in Raleigh. "Now is the time to try to purchase land in places like Johnston and Lee counties



***In metropolitan areas** such as Charlotte (left), the only remaining undeveloped land is often found along creeks and rivers. Development in flood plains is costly and unwise; preserving these areas as greenways enhances the quality of urban life.*

MECKLENBURG PARKS & RECREATION



JANE ROHLING

***Large white oaks** (above) and other old trees usually line greenways. These old-growth forests provide habitat for many birds and animals, filter pollutants from the air, reduce traffic noise, and cool urban areas in summer.*

Beautiful New Hope Creek *(right) in Duke Forest may become the focus of a proposed New Hope Creek Corridor Trail, an idea enthusiastically supported by many citizen's groups and local officials. However, controversial proposals to sell portions of Duke Forest to developers threaten the creek.*

JANE ROHLING

Laotian refugee children *enjoy a Stream Watch outing on the Neuse River with the Capital Group of the Sierra Club in Raleigh. The organization's outings program for inner-city youth centers around the city greenway system. Planners hope to protect portions of the Neuse River by incorporating a Neuse River corridor into the greenway system.*

JANE ROHLING

"Getting a good greenway on the ground to 'show off' is the best way to sell the plan to skeptical citizens. Planners have found that some people most opposed to having a greenway in their backyard have later become its greatest proponents."

because the prices are still low. But it's difficult to get citizens interested when they don't see the need."

All of the planners I spoke to agreed that getting a good greenway on the ground to "show off" is the best way to sell the plan to skeptical citizens. They have found that some of the people who are most opposed to having a greenway in their backyard have later become its greatest proponents. Thus, they recommend choosing an easy trail first — one with few obstacles to land acquisition — so that it can be completed quickly.

Volunteers are the life-blood of the greenway movement. They have done everything from trail construction to securing land donations, lobbying politicians to fundraising, landscaping to leading nature hikes. One volunteer program that has grown hand-in-hand with the greenway movement has been the Stream Watch Program, sponsored by the Department of Natural Resources and Community Development. There are now at least 111 Stream Watch groups which have adopted 80 different streams.

The Capital Group of the Sierra Club is a perfect example of how effective a Stream Watch project can be in promoting greenways. Led by Wolfgang Freidrich of Raleigh, the club has built a nature trail, conducted workshops and educational hikes, led outings for inner-city children, inventoried the flora and fauna of Crabtree Creek, and organized clean-ups — all along Raleigh greenways.

The Triangle Greenways Council is another active group. It has organized weekly Saturday morning work crews to build trails at Falls and Jordan lakes. In Greensboro, about 20 miles of trails are maintained by local volunteers. The French Broad River Foundation is cleaning up a 3-mile stretch of riverfront in downtown Asheville and also coordinating efforts of environmentalists in four counties along the river basin to establish parks, conduct clean-ups, and sponsor recreational events. In Boone, at least a dozen civic groups have expressed enthusiasm over plans for a trail along the South Fork of the New River.

With this kind of support how can you fail? Wallace Jones, a National Park Service employee in Atlanta, says that when he mentions the word "greenway" in other southeastern states, people look at him sort of funny and say, "What's that?" But when he comes to North Carolina, people tell *him* about greenways! He says the energy for developing greenways is much greater here than anywhere else in the region. That's a reputation we can all be proud of! ⊠

Getting Started

Here are a few tips from North Carolina's greenway planners that may help you get started in your community:

(1) Make your case: identify the land, define your goals, list the benefits for area residents.

(2) Develop a plan and a program: what are you going to do and how are you going to do it? Make it real — map the system and give it a name.

(3) Don't be impatient — it takes a long time. Be realistic, flexible and *creative*.

(4) Get help! Recruit a broad citizens' coalition to help, and gain the support of local politicians and developers. Educate people, talk to them, share your vision!

(5) Get one on the ground! Build a "showcase" greenway, and do it quickly. Start with an easy one.

(6) Have your tools in hand: your resolution and master plan, zoning ordinances and tax incentives, and growth plans.

(7) Hire somebody to do the job. Although volunteers can do a lot, it's essential to have at least one person with the time and technical experience to coordinate the effort.

(8) Start now! Especially if you're in an area that's experiencing rapid growth or likely to soon. Land acquisition will be easier and cheaper now.

(9) Inventory your resources and go for the important ones, the most threatened ones, and the ones that are easiest to acquire, first.

Volunteers Build 2,500 Nest Boxes

Operation Wood Duck Housing Project Successful

Written and Edited by Mark Taylor

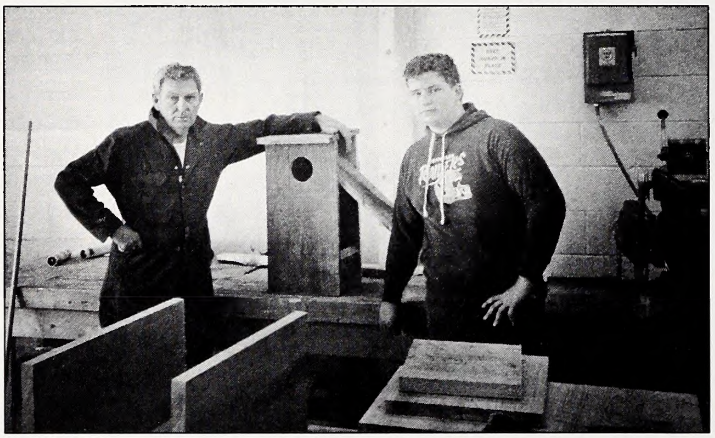
Wood ducks will have no problem finding a home in northeastern North Carolina, thanks to the efforts of the District One Wildlife Committee. This is an organization of N.C. Wildlife Resources Commission employees and private citizens working to improve wildlife habitat in Wildlife District 1, which encompasses Bertie, Camden, Chowan, Currituck, Dare, Gates, Hertford, Hyde, Martin, Pasquotank, Perquimans, Tyrrell and Washington counties.

The Commitee's first objective, "Operation Wood Duck" was to erect 2,000 wood duck boxes throughout the First District, a project sponsors believe could increase the wood duck population by 50,000 over the next 10 years. The recently completed project exceeded this goal, and actually placed a total of 2,500 wood duck boxes.

In addition to an increase of wood ducks, it is hoped the project will create interest by the private sector in wise wildlife management, promote resource stewardship, emphasize the importance of wetland habitat, and generate a cooperative spirit between the Wildlife Commission and the public.

All monies for purchase of materials to build and erect the boxes were privately raised by sponsor contributions, individual donations and District-One Committee memberships, and the Committee has expressed its appreciation to the hundreds of volunteers and contributors who made this project possible.

— *Mike Overton*



Housing Starts Up: *Manley Dunlow (left), a vocational teacher at Northeastern High School in Elizabeth City, and a student hold one of many wood duck boxes built by his classes for Operation Wood Duck.*

Workshops Scheduled

If you're an educator who works with youngsters, there are special workshops that will teach you how to use the outdoors as a classroom.

This summer, two five-day, 30-hour Outdoor Education Workshops are being offered by the N.C. Division of Forest Resources. These workshops carry three continuing education or certificate renewal credits, and focus on the process of learning in outdoor settings. Skills taught in these sessions can be used by anyone who works with youngsters in kindergarten through grade 12, and in all subjects. The schedule is as follows:

— June 20-24 at Clemmons State Forest in Clayton.

— July 18-22 at Tuttle State Forest in Lenoir.

To register, send your $25 non-refundable check to Virginia Bass, N.C. Division of Forest Resources, Archdale Building, 512 N. Salisbury St., Raleigh, N.C. 27611.

Building Habitat: *Linda Gibbs (left) and Johnny Arena spent a busy day erecting wood duck boxes on Sutton Creek.*

Fishing Tackle Donated

CATCH Gets A Christmas Present

Christmas came early recently for the Wildlife Commission's CATCH youth fishing program. The program recently received a donation of 400 "units" of fishing tackle — rods, reels and lures — from the Zebco Division of Brunswick Corporation and Berkley and Company.

The donation was made by the two companies as part of an effort to aid state wildlife agencies in aquatic education programs. Some 15,000 fishing units, worth $1.5 million, have been distributed nationally for the companies by the Sport Fishing Institute.

North Carolina's allotment of fishing tackle will be used in CATCH fishing clinics this spring and summer. These clinics are held across the state, and include two hours of instruction in fish ecology, identification, fishing techniques and water supervision.

The CATCH program is open to youths from ages 8-15, and members receive a membership card and certificate, patch, and newsletter. CATCH members may also attend a CATCH fishing clinic free.

Good Reading

Wild Orchids Of The Middle Atlantic States by Oscar Gupton and Fred C. Swope. 112 pp., hardcover. $12.50. Published by the University of Tennessee Press, Knoxville, Tenn. 37996.

Wild Orchids Of The Middle Atlantic States features the 52 species of orchids found in Delaware, Maryland, Virginia, West Virginia, Kentucky, Tennessee and North and South Carolina.

Descriptions of the flowers include information on habitat and distribution. All but seven orchids are accompanied by attractive, full-page color photographs, and the orchids are organized by color.

The book is attractive and easy to use, and anyone who is interested in wildflowers would enjoy it.

Anglers Should Follow

Spring Brings Robin To The Rivers

Southeastern North Carolina is laced with beautiful blackwater streams, and the premier game fish in these waters is the redbreast sunfish or "robin." Fortunately, May is not only a beautiful month to float these streams, but is also the peak for robin fishing.

"Robin are found in clean streams with a coarse gravel bottom, and become more active in May as the water warms up and they prepare to spawn," said Jimmy Davis of Elizabethtown. Davis is the coastal region supervisor for the Commission's Division of Boating and Inland Fisheries, and is also a long-time robin fisherman. "They're very particular about where they spawn, and will clear a nest only in coarse gravel near cover from predators — a cypress knee or sunken log is perfect. Their beds are usually along the stream bank in about 18 inches of water, although you'll also find them in deeper holes at the base of shallow runs or rapids."

JACK DERMID

A Day Well Spent: *Many blackwater rivers in eastern North Carolina offer fine fishing for robin throughout the spring. Anglers usually use crickets for bait, and flip the bait under the brushline and around tree stumps and other cover.*

Robin, like the other members of the sunfish clan, are excellent eating, but they are best known for their fight. A robin will strike a lure so hard that you'll swear for a moment you're hung on bottom, and then it'll break for the nearest cover. Most robin fishermen fish from small one-man boats or canoes, flicking a cricket or worm and bobber against the river bank with a cane pole or special sunfish rod as they control the boat with the other hand. Of course, ultralight spinning tackle also works well. A small Beetlespin is the favored lure, and black-and-yellow or crawfish are popular colors.

Many of the blackwater rivers and streams in the Coastal Plain harbor robin, but some of the smaller streams are snagchoked and difficult to float. Davis recommends the Lumber River from Wagram to the South Carolina line, Waccamaw River from the lake to the South Carolina line, the entire length of the Black River, and the South River from NC 242 to its mouth.

"These streams all offer good robin fishing, and are large enough to be easily floated," he said. "You still may have to pull the boat over an occasional downed tree. The scenery along these rivers is also beautiful. Although the water is coffee-colored it is very clean, and the streams are often bordered by old cypress forests which are rich in bird life and other wildlife.

"Be sure to fish the areas where the water is flowing in and around cypress knees and stumps," he added. "Robin hide there, and often dart out from cover to capture insects. Longer, deeper stretches also offer good fishing for chain pickerel and an occasional largemouth bass."

Fishermen may use state and county maps to locate bridge crossings at put-in and take-out points. Several boating access areas are also located on these rivers, and a listing of boating access areas may be obtained by writing the Division of Boating and Inland Fishing, N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27611.

Now Common In Pennsylvania

Reader Notes Coyotes Moving South

Dear *Wildlife:*

I was interested in your article last October, "Coyotes Come to Carolina," and thought you might appreciate further confirmation that the coyote is moving south in your direction, perhaps faster than you realize.

I have hunted deer for some 35 years on an old family farm in Wayne County in northeastern Pennsylvania. I first became aware of a local coyote population when, in 1981, my hunting companion told me he had inspected the carcass of a "coydog" that had been shot by another hunter. I was admittedly skeptical, but his description was very valid.

I became sensitive to the probability and, beginning in 1983, frequently observed coyote tracks on snow and soft ground. Generally, there would appear to be three to five animals running together. My first sighting was this past December when I watched a lone coyote through my rifle scope as he crossed a frozen beaver dam. No doubt about it. Tracks are now commonplace, coyotes are being trapped, and local farmers are very much aware of an increasing population. And that's only 400 miles from North Carolina!

— *Frank R. Hathaway*
Beaver, Pa.

You Can Look, But Don't Touch

Nesting Sea Turtles Protected By Law

If you discover a sea turtle nesting on the beach this summer, consider yourself lucky. Watch and enjoy the sight, but don't disturb these endangered animals.

"Sea turtles usually begin nesting in May and continue through the summer into early fall," said Tim Handsel with the North Carolina Aquariums. "They will nest anytime from sunset through dawn. Although many people believe sea turtles nest only on a full moon, we have found that is not the case. They will nest anytime, but are more visible when the moon is full."

Loggerhead sea turtles nest on many North Carolina beaches. If you see a sea turtle crawling up the beach to nest, be sure not to scare the animal. Any loud noise or light may spook the animal back to the water. Once a turtle has dug her nest and is laying her eggs it's all right to observe her, but keep your distance.

"Sometimes people will try to touch or even ride sea turtles," said Handsel. "This is illegal because it is unlawful to harass any endangered species. Also, these animals have a powerful bite, and you can really get hurt if you bother them."

Occasionally, people also come upon a nest that is hatching. Here again, the best thing to do is leave the animals alone.

"We've actually had people try to keep the young turtles from reaching the water because they thought they would drown," said Handsel. "If a young turtle is heading away from the water or is stuck in a tire rut, it's all right to head them in the right direction. But, for the most part, just watch and enjoy the event."

If you come upon an eroding nest, or know that an existing nest is in danger of being washed away, notify the proper authorities. Unfortunately, dead or "stranded" sea turtles are also frequently found on our beaches. These should not be touched, and should be reported immediately.

"Sea turtle strandings occur for a variety of reasons," said Handsel. "Sometimes the animals are bit by sharks or struck by boats. Others become entangled in fishing nets and drown, and some just get sick."

Workers with the North Carolina Aquariums — a part of the N.C. Office of Marine Affairs — are helping to monitor sea turtle nesting and strandings. Anyone who observes a nesting sea turtle, knows of a nest location, or finds a stranded sea turtle should call the nearest aquarium. The three aquariums are located at Manteo (473-3493), Pine Knoll Shores (247-4003), and Fort Fisher (458-8257). An excellent exhibit featuring live sea turtles is being displayed at the Pine Knoll Shores Aquarium through next year.

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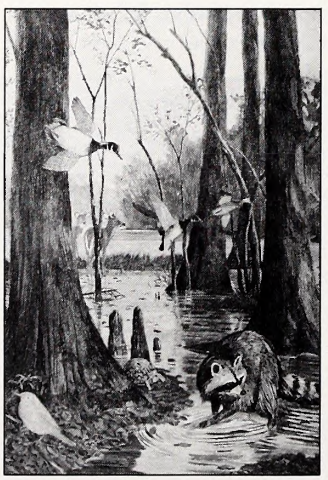

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Field Notes

Season openings, closings, and regulation changes:

- Wild turkey season closes May 7.
- Trout season open.

Refuge Hunt Rules Change

There have been some changes concerning youth hunting on national wildlife refuges. In the future, any youth who hunts on a refuge must first pass a state-sponsored hunter-safety course. This policy will apply to all national wildlife refuges in North Carolina during this fall's hunting season.

A youth is defined as any hunter under the age of 16. Youth hunters must be supervised by an adult 21 years of age or older. For small game hunts, which include waterfowl hunts, the adult may supervise no more than two youths. For big game hunts, the adult may supervise only one youth. Also, on designated youth hunts, the supervising adult may not carry a weapon or discharge a youth's weapon.

Youths who wish to hunt on a national wildlife refuge must demonstrate that they have completed a hunter-safety course by presenting a card or certificate showing they passed the course, or a letter from their hunter-safety trainer indicating they passed. They should present this material at the refuge where they plan to hunt.

"The purpose of this new policy is to promote safety, quality hunting, and outdoor ethics while hunting on national wildlife refuges," said Larry Ditto, manager of the Lake Mattamuskeet National Wildlife Refuge. "North Carolina has one of the best hunter-safety courses in the country, and we urge all new hunters — youth and adult alike — to take one of these courses."

Information on the new policy and information on hunting on national wildlife refuges in North Carolina is available from the Lake Mattamuskeet National Wildlife Refuge, Rt. 1, Box N-2, Swan Quarter, N.C. 27885.

Checkoff Contributions Set Record

Tar Heels Dig Deep For Nongame

North Carolinians really care about nongame wildlife. That's one conclusion which could be drawn from examining last year's contributions to the Nongame and Endangered Wildlife Fund — a record

$384,758. This represents a 16 percent increase over contributions made in 1986.

Over the past four years, contributions to the fund — made largely through the checkoff on state income tax forms — have totaled $1.2 million. This has helped support research and management of the endangered bald eagle, northern flying squirrel, peregrine falcon, Virginia big-eared bat, and Tar River spiny mussels. In addition, the fund supports management of threatened sea turtles and many shorebirds.

"We want contributors to know how much we appreciate their contribution to the North Carolina Nongame and Endangered Wildlife Fund," said Charles Fullwood, executive director of the Wildlife Commission. "We can't thank contributors personally because income tax records are strictly confidential. However, most states with a nongame tax checkoff have seen a decrease in contributions after the first few years. Fortunately, that hasn't been the case here, and this shows that North Carolinians are seriously concerned about protecting the wildlife resources and environmental quality of our state."

— *Angela Hill*

New Law Effective

Hunting Safer With Blaze Orange

Hunting is statistically a very safe sport, and it was even safer last fall thanks to the new blaze orange law. This law requires deer, bear and boar hunters using firearms to wear an outer garment or hat of blaze orange.

When the deer seasons closed, four hunting fatalities had occurred — the lowest number since the Wildlife Commission began keeping statistics in 1960. In contrast, nine deaths occurred in the 1986-87 seasons. The number of non-fatal accidents was also nearly halved. Twenty injuries were tallied last fall — nine of them self-inflicted — compared to 37 in the previous season.

The fatal accidents that did occur, however, pinpoint the importance of wearing blaze orange. Of the four victims, none were wearing blaze orange, and two were hunting illegally.

"We're not really surprised that the number of fatal accidents dropped last fall," said Captain Wilton Pate of the Wildlife Commission's Division of Enforcement. "This has happened in every state that has enacted a blaze-orange law. If people comply with the law, it almost completely eliminates accidents that occur when someone is mistaken for game or is unseen and in the line of fire.

"The remaining accidents are usually self-inflicted or are the result of mishandling of firearms, so it's vital that hunters handle guns safely. Also, youths and those new to hunting should take one of the hunter-safety courses offered by the Wildlife Commission."

— *Angela Hill*

Angler Doubles His Pleasure

Two On One: *Hunters sometimes score a double on quail, but it's not everyday that a fisherman takes a double on bass. Graham Lynch of Roanoke Rapids did, though, catching these two 1½-pound bass on one lure. Lynch was fishing with Mike Baird, past director of the Roanoke Rapids High School Band, when he caught the fish on a black and silver Rapala.*

The Wildlife Endowment Fund Report

The Wildlife Endowment Fund is supported by the sale of lifetime licenses, lifetime subscriptions to *Wildlife in North Carolina*, and tax-deductible contributions. Only the annual interest from this fund is used for wildlife conservation, and the fund will play a key role in supporting wildlife programs in the future. Interest is earned through investments made by the State Treasurer's Office. For more information, write to the Wildlife Endowment Fund, N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27611.

Status on February 29, 1987

	Numbers Sold	Revenue Received
Lifetime Sportsman's License	44,221	$14,064,113.21
Lifetime Hunting License	311	72,654.42
Lifetime Fishing License	3,318	605,119.20
Lifetime Subscriptions to Wildlife in N.C.	1,290	164,069.39
Contributions	—	104,379.25
Fund Total		$15,010,335.47
Total Interest Earned	$2,635,991.90	

Calendar Of Events

April 30-May 1
15th Annual Watauga Spring Festival at Appalachian State University in Boone. Features traditional music and crafts.

May 1
Spring Open House at the Duke Homestead State Historic Site in Durham. Living history demonstrations of blacksmithing, spinning, weaving and other 19th century skills.

May 6-8
16th Annual Spring Wildflower and Bird Pilgrimage in Asheville. Birding, hikes and wildflower walks. For more information contact James Perry, Department of Biology, UNC-Asheville, Asheville, N.C. 28804.

May 7-8
Traditional Wooden Boat Show at the North Carolina Maritime Museum in Beaufort. Features displays, competition, and races of traditional hand and sail powered craft.

May 27-29
Grandfather Mountain Nature Photography Weekend in Linville. Features classes and field sessions on nature photography. For more information contact Catherine Morton, Box 128, Linville, N.C. 28646.

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"This attractive book is probably intended for the sports or outdoors person; but in fact it should appeal to anyone with an active interest in our state's history, natural or otherwise."
— Michael McFee, *The Spectator*

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"It is not only for the sportsman in the family but for all the family and an excellent book to send both to Tar Heels who have moved away and to folks who have just moved into North Carolina . . . . The only fault I find with *Wildlife in North Carolina* is that it is not long enough."
— Buggs Barringer, Raleigh *News and Observer*

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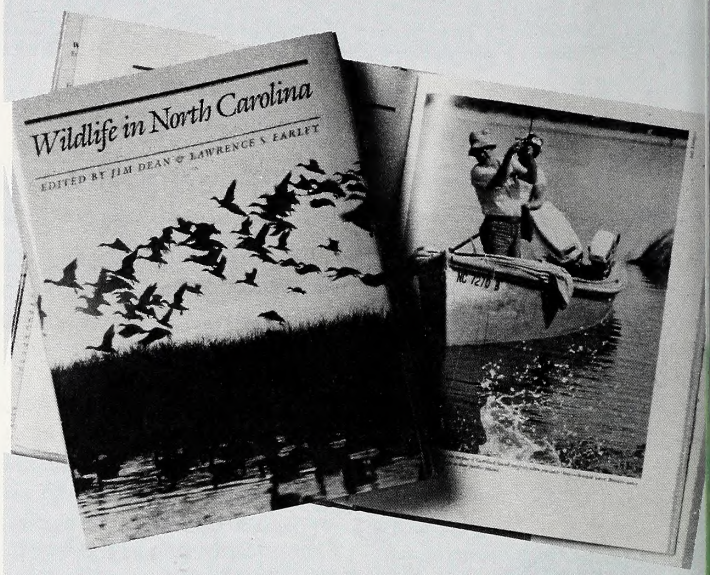
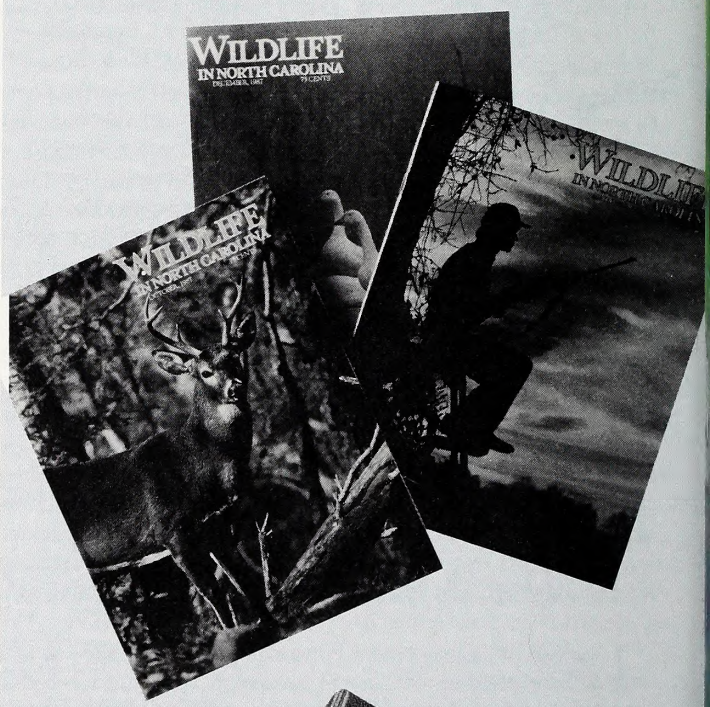
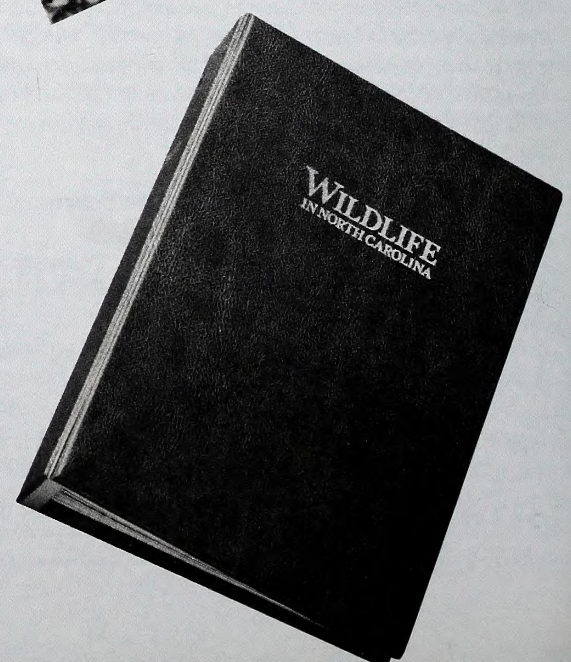
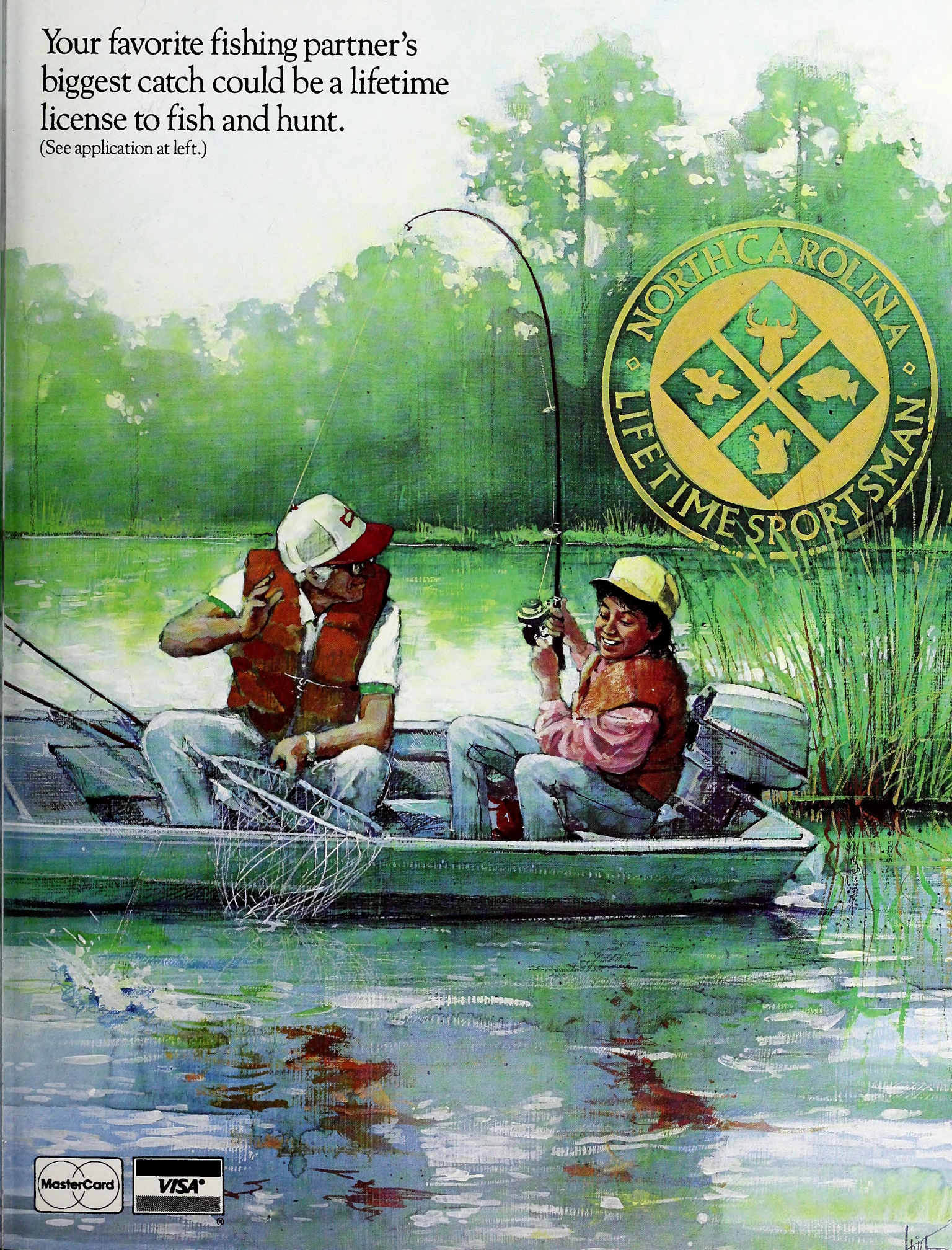






Your favorite fishing partner's biggest catch could be a lifetime license to fish and hunt.

(See application at left.)



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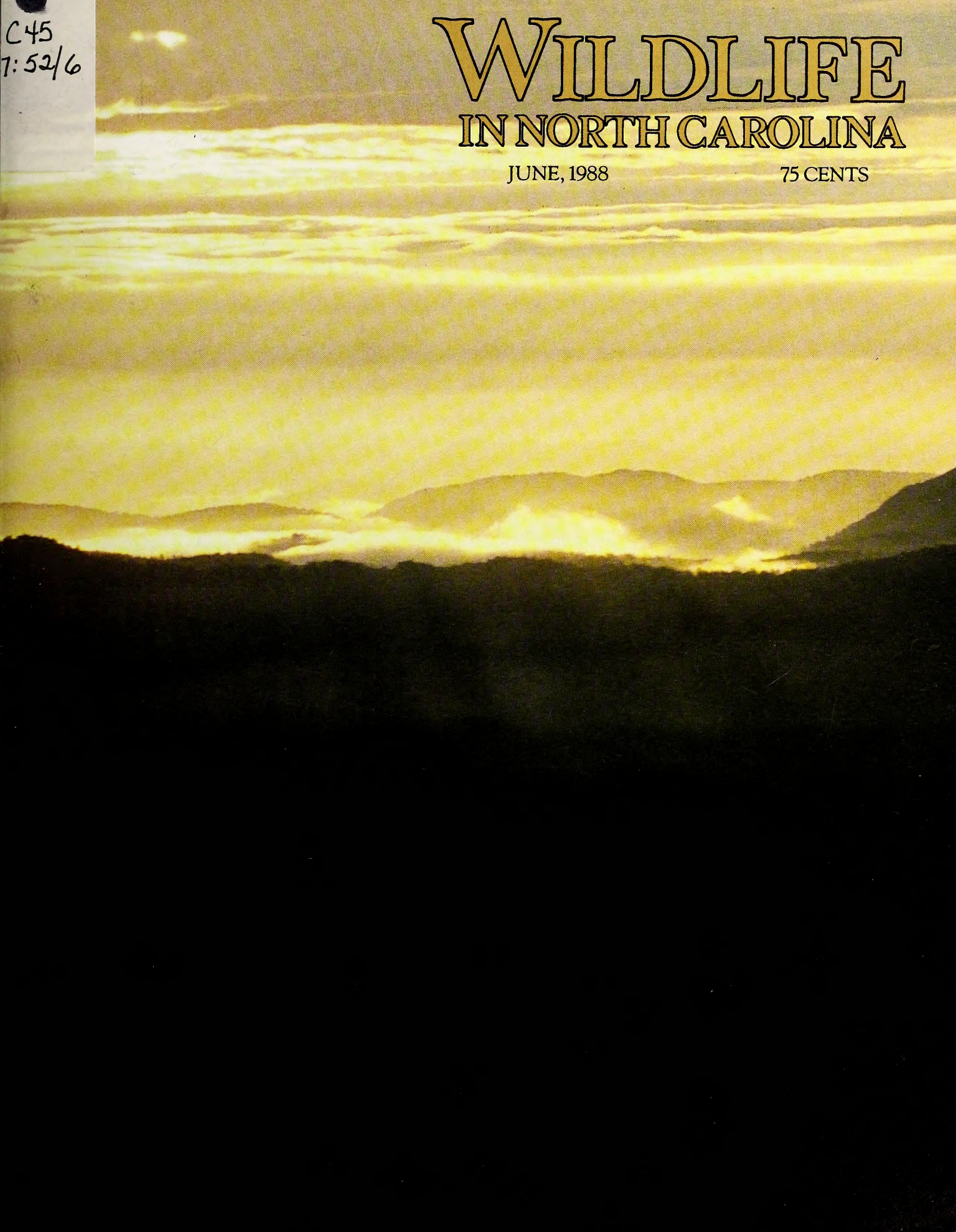

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Tuned In On The Outdoors

by Jim Dean

When joggers pass you on the street wearing those little radio-cassette units with headphones, you almost invariably wonder what they must be listening to. That teenager probably has an earful of Sting or Echo and the Bunnymen. The thirtyish couple? Probably early Bruce Springsteen. A late middle ager might be grooving on Sinatra or The Drifters, while some of us pre-geezers may be bopping along to elevator music or "Liebestraum."

Sometimes, there's a clue. Once, I saw a lady suddenly stop jogging and go into a wild boogaloo that carried her off the path and down through the woods where I could catch just enough of her accompanying rendition to identify it as "In The Midnight Hour." A few moments later when Wilson Pickett had finished his irresistible anthem, she reappeared on the path and continued jogging as though nothing had happened.

I confess I have been tempted to carry one of these portable radio-cassettes on some — but certainly not all — hunting or fishing trips. It's already a time-honored pastime to listen to a baseball game while soaking crickets for bluegills, a connection overlooked by Ted Turner. Just think, it could have been "America's team — the Atlanta Bream."

ILLUSTRATION BY JACKIE PITTMAN

This past spring, Jim Simons and I sat in a pod of boats at the mouth of Contentnea Creek and caught about 20 hickory shad while listening to the ACC Tournament being broadcast from one of the other boats. Nobody seemed to be offended — at least not until their team lost.

But perhaps music would also fit certain occasions. At least, with headphones, you wouldn't annoy any companions. You could, for example, listen to Handel's Water Music while surf fishing. You could greet the glorious dawn in a duck blind accompanied by Tchaikovsky's "1812 Overture." Planning a late-night run to Hatteras or some other hotspot? Bob Seger, Foreigner, or some Dixieland jazz will keep you alert. Indeed, some cooler jazz notes — Chet Baker or Bill Evans, perhaps — would not be out-of-place while soaking up rays and working a plastic worm over some prime mid-summer bass structure.

While wading the jade limestone streams of pastoral mid-Pennsylvania amidst a billowing hatch of mayflies, I have thought that Vivaldi or Billie Holiday might be just the thing to complete a poetic moment. On the other hand, our mountain trout streams are best paired with Ralph and Carter Stanley's raw bluegrass.

Some years ago, I happened to be wading a trout stream that meandered within a hundred yards or so of a church picnic, and I will not soon forget the haunting strains of "Amazing Grace" and "Whispering Hope" that filled that valley in the gathering twilight. As they say in them thar hills, "H'it were wonderful, and I come mighty nigh gitting saved." But not nigh enough to ignore those rising browns, although I did get baptized, sort of, when one of those slick, round rocks rolled under my feet.

One hazy Sunday morning in the 1970s, I also fished a hole in a salt marsh while the distant muted bells of a church in Beaufort played hymns. Those chimes didn't sound a bit out of place against that backdrop of pale green stretching towards an endless sky.

Of course, there are many times music would be decidedly unwelcome. I distinctly recall years ago the top 40 bubblegum music I had to endure briefly at the hands of an insensitive waterfowl guide. Imagine watching for incoming mallards accompanied by "It was an itsy-bitsy, teeny-weeny, yellow polka dot bikini." The only thing worse would be "Disco Duck." But the guide and I quickly reached an understanding. I told him his radio happened to be sitting precisely where I was about to shoot.

The truth is, however, that with few exceptions, most of us have no desire for any man-made music while we're pursuing outdoor interests. We are atune to that vast and diverse musical score orchestrated by nature, and that's often more than enough. What, after all, could possibly top the melodies of wood thrushes, mockingbirds, redwing blackbirds, spring peepers and night bugs? Still, that's not the only kind of "music" some of us might cherish.

One of my fondest memories is the uneven drone of a small outboard passing a riverfront cabin at daybreak. At first, you are barely awake, conscious only that it is no longer dark. Then, you hear that very faint intrusion, and you know it will grow steadily louder for at least 30 minutes. You also know that it will take at least that long for it to fade, and further sleep is out of the question. But it's a sound I would welcome at dawn any day, if for no other reason than to be wrapped once again in the early morning cypress smell of a cabin, and hear black water gently slapping the pilings.

June, 1988
Volume 52, Number 6

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WILDLIFE IN NORTH CAROLINA

Wildlife in North Carolina is the official educational publication of the North Carolina Wildlife Resources Commission, and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources and the environment we share with them.

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Cover *At dawn on the peaks along the rim of Linville Gorge, it is easy enough to imagine that you are alone in the world. Photography by Barry Rosen.*

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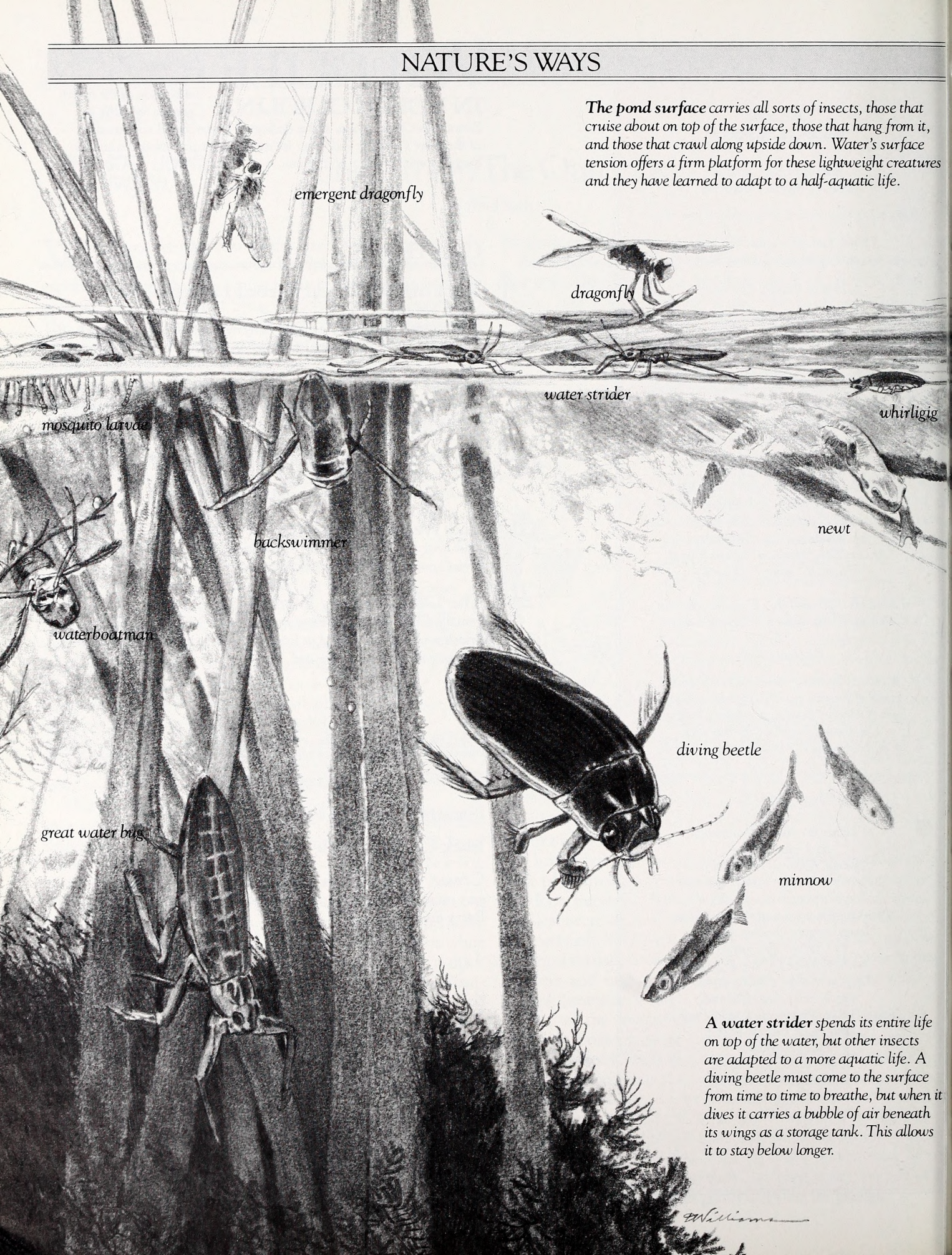


The pond surface *carries all sorts of insects, those that cruise about on top of the surface, those that hang from it, and those that crawl along upside down. Water's surface tension offers a firm platform for these lightweight creatures and they have learned to adapt to a half-aquatic life.*

A water strider *spends its entire life on top of the water, but other insects are adapted to a more aquatic life. A diving beetle must come to the surface from time to time to breathe, but when it dives it carries a bubble of air beneath its wings as a storage tank. This allows it to stay below longer.*

Life On The Surface

written by Lawrence S. Earley / illustrated by David Williams

The hapless land beetle *above has fallen into the water and is now imprisoned by the surface tension. Its struggles will eventually attract a predator. Yet pond insects skate on top of the water, or hang from beneath the water surface, and never sink. Thus a water strider bobs to the surface if it is accidentally immersed. A whirligig rides half above and half below the surface because the top half of its body is unwettable while the lower half is wettable. It has two pairs of eyes, one pair below and the other above the surface.*

So many resourceful animals have found niches in impossible habitats that the whole subject may seem just a bit commonplace. Then you find out about the abundant insects that have colonized both sides of the pond surface and you just can't stop shaking your head. How could so many air-breathing animals — even tiny ones — have adapted to such a fluid and dangerous medium?

One reason is that water offers a firmer platform than you might think. This is because of a curious property of water known as "surface tension." A good way of thinking about surface tension is to imagine water as having an outer skin, an elastic film that is tough enough to support the weight of a light object like an insect. Thus the nervous water strider skates hither and thither and never sinks.

But insects themselves have developed interesting adaptations to exploit the surface habitat. The water strider's body, for example, repels water, bobbing immediately to the surface if it is doused. Its feet are equipped with water-repelling hairs that help it to stand on top of the water. Lacking this adaptation, a fallen terrestrial insect such as an ant is imprisoned by the surface tension.

The whirligig beetle, another rider on the surface film, has developed different characteristics to enable it to exploit life on the surface. This insect, gyrating wildly like a carnival car, rides with half its body below the surface and half above. That's because only the upper half of its body is unwettable. It has also developed two pairs of eyes, one pair that sees above the surface and the other that sees below. Thus this enterprising omnivore can hunt not only on top of the pond, but can dive to the depths below.

A different cast of characters with different adaptations are found hanging on the underside of the pond surface. These are insects that must come to the surface to breathe. The largest and scariest is the giant water bug, a 3-inch monster that preys on insect larvae, fish and even frogs by sucking them dry. There's the backswimmer, an insect that looks like a boat propelled upside down by a pair of stiff oars. And there are others, including the 1½-inch great diving beetle, the waterboatman and mosquito larvae.

They spend most of their time roaming the pond depths, but unlike fish whose gills extract oxygen directly from the water, these insects must take in oxygen at the surface. In this respect, they are like dolphins, whales and other aquatic creatures that come to the surface to breathe air into their lungs. The insects also store air, but their storage systems are external rather than internal.

When the diving beetle surfaces, for example, it angles its body so that tiny hairs behind the abdomen break through the surface tension. These hairs take in a bubble of air that is stored beneath the wing cases. When the beetle dives, it breathes air from the bubble until the air is gone. A backswimmer also carries a bubble of air, but when this bubble is emptied oxygen from the water is diffused into the bubble as if the bubble were a physical gill. This enables the backswimmer to remain submerged for even longer periods.

On both sides of the pond's surface skin prowls a diverse insect life, proving once again how well animals exploit difficult habitats.

Tracking The World Record LARGEMOUTH

Mystery still surrounds the biggest largemouth bass ever caught on rod and reel, but the contenders weigh in at more than 20 pounds.

***A Creek Chub** Wiggle Fish in perch color like this one above (shown roughly twice lifesize) is the lure George Perry used to catch the world-record largemouth bass in 1932.*

by Jim Dean
color photography by Melissa McGaw

Bill Baab didn't hesitate when the question came. He knew it was coming because everybody asks sooner or later. Do you believe George Perry really caught the 22-pound, 4-ounce current world-record largemouth bass in 1932?

"Yes, I do," said Baab. "I got to know George Perry very well in the years before he was killed in an airplane crash in 1974, and I've also spent a lot of time talking to surviving members of his family, and to anyone else who might know anything about it. I think there's ample evidence to support it even though no photograph exists. I also think you have to consider the circumstances under which the fish was caught. I'm convinced George Perry caught that bass."

Baab's opinion should count for something. As outdoor editor of the Augusta Chronicle-Herald for over 20 years, he has probably spent more time than anyone sorting through the mass of confusing information surrounding Perry's catch. Some of that information has been pretty well accepted.

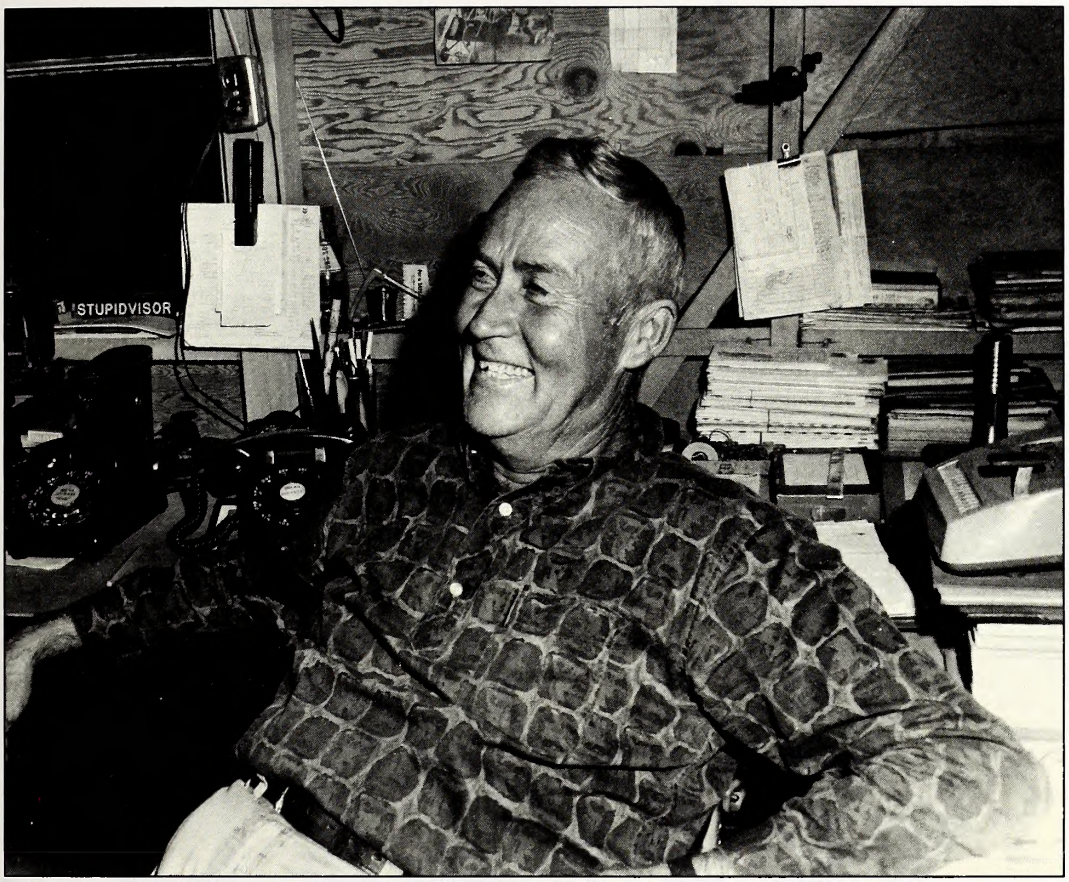
It is known, for example, that George Perry took a very big bass to a grocery store in Helena, Georgia, on June 2, 1932 to show it off. When someone suggested that the bass might win $75 worth of outdoor merchandise in the annual *Field & Stream* fishing contest, Perry had the fish weighed on the store's certified scales. As required, its length — 32½ inches — and its egg-swollen girth — 28½ inches — were also recorded.

Perry says his mother, Laura, then cooked the bass, and the family ate it. Perry's sister, Rubye, was 13 at the time, and doesn't remember much about the fish. But she vividly recalls that her brother won the contest and selected a Browning automatic shotgun, some shells, a rod and reel and some outdoor clothes.

"Perry and his family say no photographs were taken, but that hardly seems strange when you figure how few cameras there were in rural Georgia in the middle of The Great Depression," points out Baab. "Indeed, it would have been odd only if the family had not eaten the fish. Perry and his family were poor dirt farmers, and he was fishing for food. Had it not been for the contest and its prizes, it's doubtful that the fish would even have been weighed and measured. That $75 worth of merchandise must have seemed like a lot of money then."

It also seems more than coincidental to Baab that the measurements recorded for the bass closely fit modern projections for a largemouth that size. "How would a rural Georgia kid barely 20-years-old, or a store owner for that matter, know the right measurements to enter?"

As for what actually happened the day Perry caught that bass, Baab has probably



***George Perry relaxes** in his office a few years before he was killed in an airplane crash in Alabama in 1974. Perry is remembered by his son, George Larry Perry, as an intelligent, friendly man who remained a skillful angler all his life.*

***In a photo** taken after George Perry's death, family members pose with a cast replica of Perry's 22-pound, 4-ounce record bass. These fairly recent replicas were not made by Perry or his family, and some anglers have pointed out that a true replica would undoubtedly have a larger belly and smaller head.*

***This 10-pound largemouth** was caught by George Perry about five years after he caught the record largemouth in Lake Montgomery, a backwater oxbow of the Ocmulgee River in southeast Georgia.*

Frederick Joseph "Fritz" Friebel *(shown right) holds the 20-pound, 2-ounce largemouth he caught in 1923 in Florida — the world record prior to George Perry's catch. The massive pot belly on this largemouth — partly detached at the throat — partially obscures another big bass behind it. Shown with Friebel are his brother-in-law, Matt Klassen (left), and friend, Allan Prah.*

come as close as anyone will to piecing together an account from his conversations with Perry and others. Baab says Perry's story was consistent all the times the two of them discussed it.

Perry told Baab that it was raining the day he went with an older friend, Jack Page, in Page's pickup truck to an oxbow in the Ocmulgee River in southeastern Telfair County. The oxbow, a rather small, quiet backwater, is known as Montgomery Lake. The pair fished from a homemade wooden jonboat built by Perry with 75 cents worth of materials. They had no outboard — few did in those days. The identity of Page, incidentally, remains a mystery since no surviving family members recall him. That needn't be suspicious, however, if you consider how few of your casual childhood friends could be identified by members of your family after several decades.

Perry described the fishing as very poor that day, and the two anglers took turns casting with Perry's $1.33 steel casting rod and bait-casting reel. The reel was spooled with 25-pound test silk line, and the lure used was a $1.25 perch-colored Wiggle Fish, a glass-eyed wooden lure introduced by Creek Chub in 1925. Perry's son, George Larry Perry, seemed to recall that his father might have had two lures with him on the trip, but Perry always maintained he had only one — the Wiggle Fish. Perry said he cast the Wiggle Fish into a pocket created by two fallen trees.

"All at once the water splashed everywhere," Perry told Baab. "I remember striking, then raring back and trying to reel. But nothing budged. I thought I'd lost the fish, that it had dived and hung me up. What had me really worried was the lure — it was the only one we had between us.

"A fish that size isn't too spectacular, only heavy," Perry said, pointing out that he was more interested in getting it into the boat than enjoying any sport. It was the only fish caught, and when Perry stopped to show it off in Helena, he said he initially had no plans for it beyond supper.

It is unlikely that much more will ever be known about Perry's giant bass since most of the people who would remember it are dead. Indeed, when Perry sought additional corroborating information from *Field & Stream* in 1970 to help lay the controversy to rest, he learned that the records had apparently been destroyed.

"I'm sure it was just a matter of housecleaning," A.J. McClane, fishing editor of the magazine, told Baab later, "but the decision was made to heave out the old files. It's a tragedy now. And, no, I never saw the

***Fritz Friebel's huge** largemouth was caught on another Creek Chub lure, reportedly in perch color, the popular Pikie Minnow shown above about twice lifesize.*

Perry files." Nor does the International Game Fish Association, which now maintains such records, have any of the original data.

Baab believes much of the continuing controversy over Perry's all-tackle world record largemouth is the result of careless reporting that occurred shortly after the bass won the *Field & Stream* annual fishing contest and was established as a record. Indeed, some of the accounts published at that time were apparently faked by writers seeking a sensational scoop. There were, for example, conflicting reports concerning the type of lure used, the identity of Perry's fishing companion (some said it was a man named Al), and whether the anglers used an outboard motor. Indeed, a photo of the record bass was even published, although Perry stoutly maintained all his life that no photograph was ever taken. Those earlier erroneous reports have fed doubts that linger even now among some anglers.

Although the controversy followed Perry the rest of his life, he remained an avid and accomplished fisherman, and his son has fond memories of the many days he and his father spent fishing for bass in the Altamaha River swamps. "Overall, I remember Dad as a happy, humorous, nice person. He had an 8th-grade education, and was a self-made man, but he was not even close to being illiterate." He and his son also caught a lot of big bass, but never anything to equal the one brought to Helena in 1932.

It is perhaps interesting to note that Georgia fisheries biologists suspect that Perry's bass may not have been one of the Florida-strain largemouths noted for their ability to grow to outlandish proportions. Perry's fish was apparently caught too far north to be a member of that fast-growing subspecies. If true, it makes Perry's record all the more remarkable.

Perhaps not surprisingly, some doubting anglers believe that the true bass record might, until recently, have rightfully belonged to Frederick Joseph "Fritz" Friebel. Friebel caught his massive 20-pound, 3-ounce largemouth in Pasco County, Florida in 1923. That bass — most likely a true Florida largemouth — was also caught on a Creek Chub lure, a perch-colored pikie minnow. At least one picture of it exists, and it was recognized as the all-tackle record until Perry's bass replaced it.

More recently, huge bass have turned up with some regularity in several southern California lakes where Florida-strain largemouths have been stocked in fertile lakes that also contain big populations of stocked trout. These transplanted, fast-growing largemouths have grown fat on the trout, and in 1980, Ray Easley of San Diego landed one in Lake Casitas that weighed 21-pounds, 3-ounces — second only to Perry's bass.

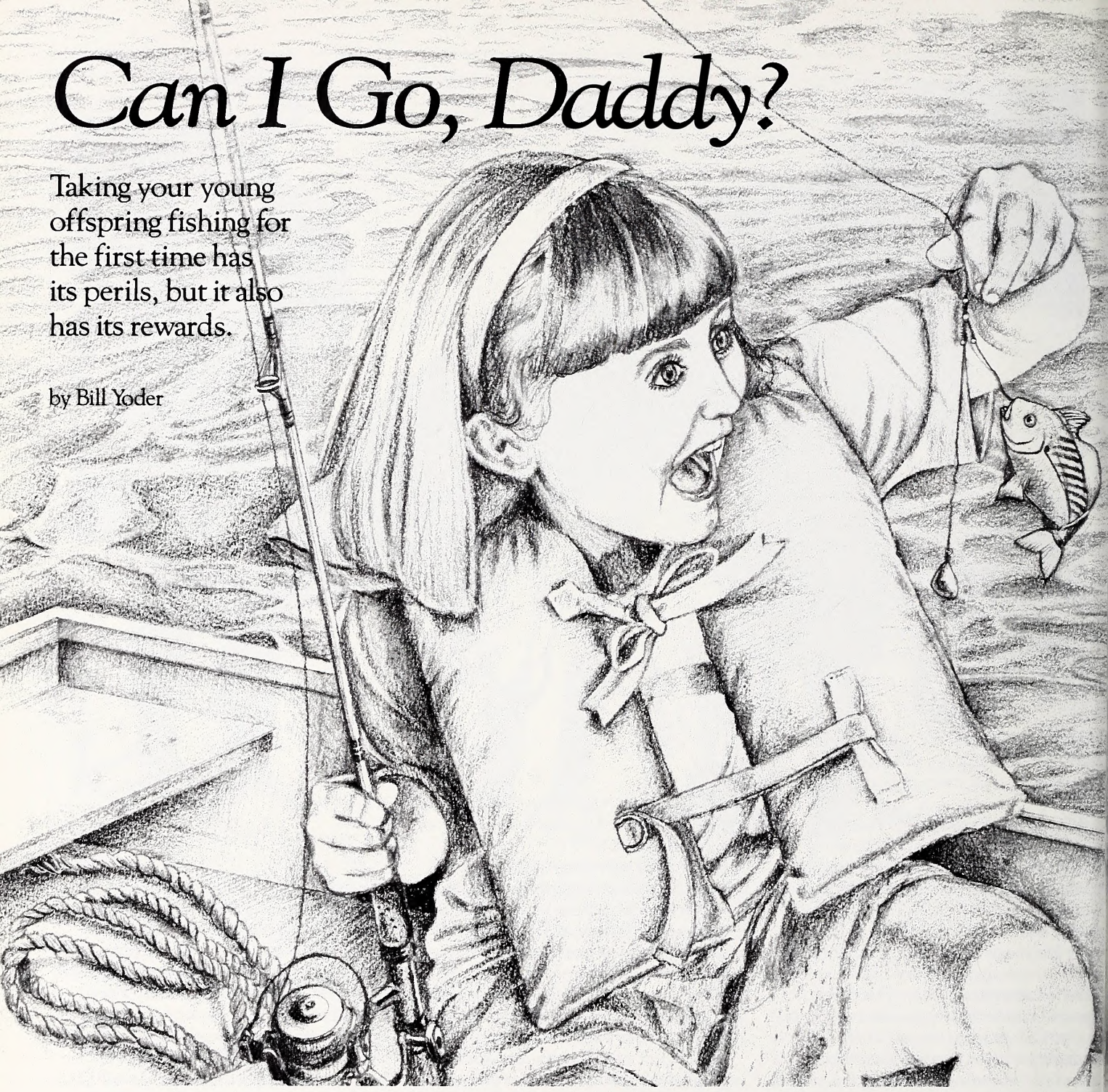
Despite years of controversy, however, Perry's bass remains firmly entrenched as the all-tackle record. Will his mark ever be topped? Some believe there are bass yet to be caught in California that could beat it. Others compare that possibility to Babe Ruth's homerun record. Like Roger Maris' 61 homers hit during a longer season, a West Coast transplant grown fat on hatchery trout just wouldn't be the same.

Baab has his own thoughts on the subject. "With fishing pressure as intense as it is today, few bass are likely to survive long enough to reach or exceed 20 pounds under normal conditions, and who turns loose 10-pounders to let them grow bigger?" he says. "I'm convinced George Perry legitimately holds the world record, and I hope no one ever breaks it." ⊠

Can I Go, Daddy?

Taking your young offspring fishing for the first time has its perils, but it also has its rewards.

by Bill Yoder



"I'm going to get rid of this thing," I groused as I fiddled with the aluminum jonboat and all the attendant equipment that had been sitting idle in the garage for months.

I bought the outfit six years ago thinking I would enjoy fishing on the many good lakes around Charlotte. But the truth is I have only managed to get out three or four times a year. I also haul the boat down to Emerald Isle at vacation time each summer, and this was the trip I was preparing for as I wrestled to get everything ready.

Emerald Isle is one of the coastal resort towns on the long barrier island formed by Bogue Inlet on one end and Beaufort Inlet on the other. The sound between the island and the mainland, as wide as 3 or 4 miles in some places, is Bogue Sound. I've always enjoyed puttering around in Bogue Sound, but this year was to be different in ways I hadn't expected.

Once we had arrived at the beach and began settling into our rented cabin, my 6-year-old daughter, Lauren, asked if I was going down to the "pond" to fish. Her's is a particularly apt description; the normally calm, mostly shallow waters do bear a striking resemblance to a pond.

"Yes, sugar, I'll probably go fishing in the pond tomorrow."

"Can we go?" she asked, the "we" including her 4-year-old brother, David.

Since we have a 6-week-old baby, in addition to these two older children, and since my wife is rather ragged from having to meet the incessant, round-the-clock demands of a newborn, I agreed to take Lauren and David with me.

The next morning we made our way across the sound to the deeper waters of the inland waterway where we anchored and

ILLUSTRATION BY GINNY RAYNOR BROWN

began to make preparations to fish. I baited each child's hook and dropped it into the water — and thus began a circus of flying lines, snarled reels and continuous cries for more bait. But we persevered.

Once, while I was bending over the cooler to retrieve some bait for David's line, I straightened up and came face-to-face with a tiny, wiggling spot Lauren had hooked and reeled in all by herself. I looked at the fish and then at Lauren in total surprise.

"You caught that fish all by yourself!" I exclaimed.

"I know, daddy!" she squealed as she danced from foot to foot. She was so excited that she could not stand still.

"Way to go!" I cheered as I unhooked the scrawny critter and flipped him back in the water. It was a thoughtless act. Lauren's face froze in a look of horror.

"What did you do that for?" she asked incredulously.

"Well, he was so small . . ."

"That was my fish!" she exclaimed. "I wanted to keep him!"

"But . . ."

"Why did you throw him back?" she demanded.

I really did regret having tossed the little fish back, but there was nothing I could do about it at that point, so I soothed Lauren as best I could and re-baited her hook.

"You catch another one," I suggested, which she promptly did. And then another, and another, and another. She was wide-eyed with amazement as she pulled them in. David even caught a couple of the little fish, but he was more interested in watching Lauren. We *kept* these fish, which I later cut up for bait. After a couple of hours baking in the merciless sun, we packed up and headed for home, putting the boat away for another day.

I did not appreciate the true significance of Lauren's fishing experience until she was getting ready for bed that night. She looked up at me with a radiant glow and said, "Daddy, I was SO proud when I caught those fish today!" She didn't really need to say the words. Her emotions were written all over her face.

We went fishing again the next day, with about the same results, but in the process something else happened. Lauren asked me to show her how to cast, saying she wanted to do it herself. I eyed the lead weight on the end of her line and surveyed the close quarters of our boat. I wasn't so sure it was a good idea to have her flinging that "weapon" around. And besides, she was fishing with an open-faced reel, and I could just imagine the snarls she could create. But she looked so eager that I decided to let her try.

"Hold the line with your finger," I said, showing her how to pinch the line against the rod with her index finger, "and let go just as soon as you throw the rod toward the water."

Her first couple of casts produced predictable results, with the heavy weight splashing into the water right beside the boat. But there was no snarled line and no one was injured. Lauren cast and reeled. Cast and reeled until she was satisfied she could do it. I was amazed. Amazed at her interest. Amazed at her coordination. And amazed at her quick mastery.

The next day we went fishing again. And this time, Lauren announced she wanted to bait her own hook. I showed her how to put a piece of shrimp on the small hook, figuring she would have a jabbed finger soon enough, and beg me to bait her hook again. Not so. Lauren sensed that by mastering the baiting of her hook she was also mastering her destiny as an angler. She was not to be denied, despite the fact she did indeed nick her finger on a hook before the day was done. She was a study in complete determination as she worked at fishing that day. (Little brother David was content to watch and piddle in the water with a piece of rope. Fishing lost its fascination for him rather quickly.)

On one of the last days we were at the beach, I resolved I was going to try and do some "serious" fishing. That is, I was going to at least go at a time (in the evening) and to a place (in the marshes) where bigger fish might reasonably be expected to be feeding. I announced my plans to my wife early in the day so we could make arrangements for me to be gone that evening. Lauren overheard.

"Can I go?" she asked, hopefully.

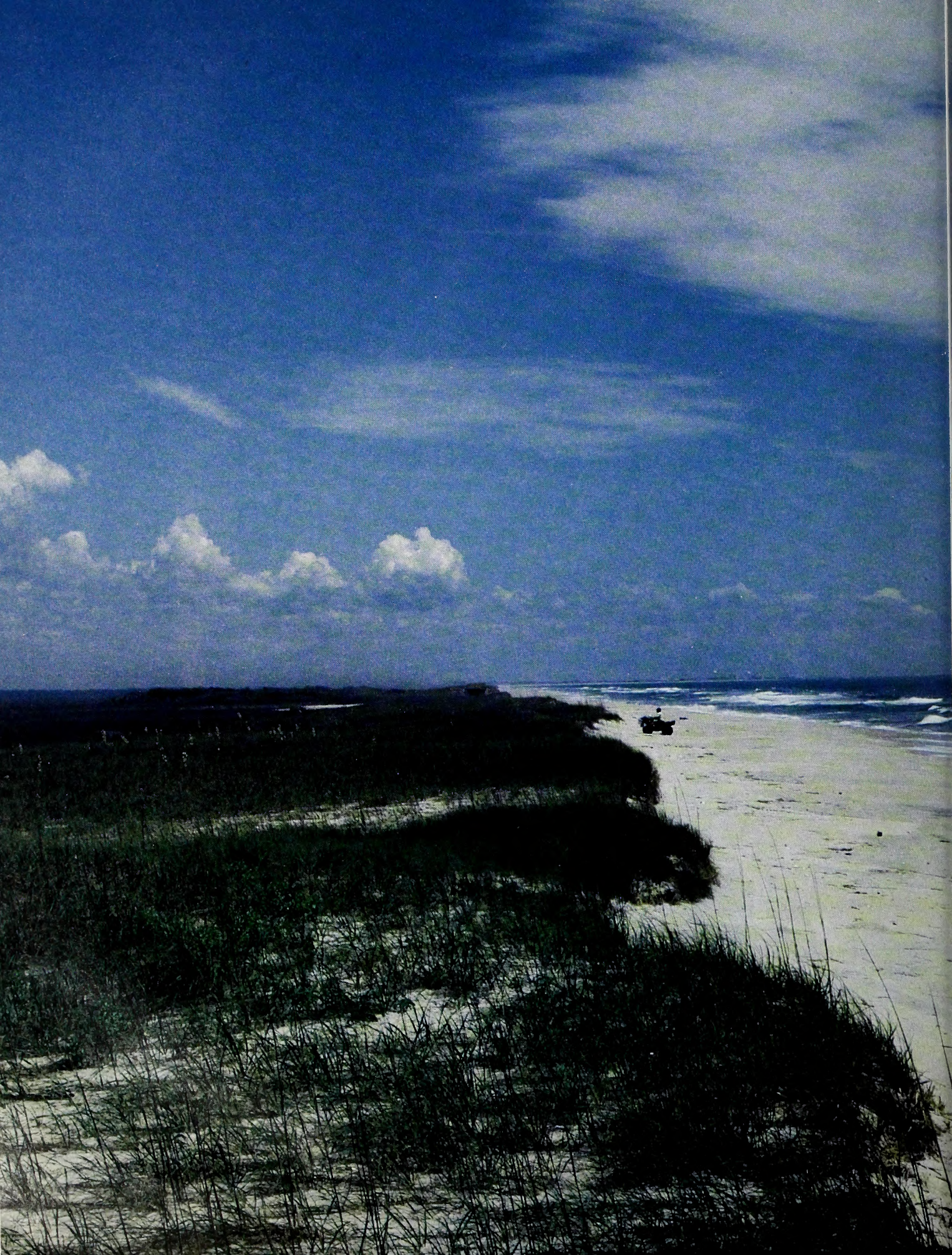
I was torn. It was one thing for her to play around in the boat in the middle of the sound in the middle of the day. It was another thing entirely to head off in the evening into the marshes. But her look was so hopeful that I could not say "no."

That evening we headed across the waterway in search of our fishing spot. The trip took about 25 minutes, and we only ran aground in the shallow waters once as we made our way to the site I had chosen — a 20-foot deep channel that had been dredged in the marsh leading to a private marina. We anchored and I showed Lauren where to aim her casts to reach the deep water on the edge of the grass.

The fishing was slow, but the scenery was absolutely gorgeous as the sun began its slow descent over the undisturbed wildlife habitat. It was a moving experience just to be there, and I sensed that Lauren felt it, too. For two hours we fished, catching little more than seaweed as the late afternoon sun gave way to dusk, then to darkness. I kept expecting Lauren to get restless and beg to go home, but she didn't.

In the last light of day, I saw a flicker in her eye. It was the undying flame of hope of a hopelessly addicted fisherman. Lauren was hooked, and I know she will be among the ranks of dedicated fishermen for the rest of her life.

I also know that I won't be selling the little boat that, until now, has sat unused and unappreciated in the driveway for so long. It now has a crew befitting it. ⊠



JIM PAGE

JEWELS ON THE COAST

Four natural areas along the coast are the core of North Carolina's estuarine reserves, serving as outdoor laboratories and classrooms.

by Kathryn Henderson

A young man bent down and felt what appeared to be the leaves of a strange, leathery plant growing at the edge of a coastal shrub thicket. "What is it?" he asked the tour leader. The leader looked it over carefully and then replied, "That's a glove."

It was, indeed, a real glove, apparently lost by someone. Though embarrassed when the other members of the group laughed, the man soon laughed too, and said, "Well, at least now I'll know the exotic glove plant the next time I come to the beach."

The "glove plant" is just one of the discoveries visitors to the North Carolina National Estuarine Research Reserve have made. In fact, learning about the coast firsthand is what this "natural, outdoor laboratory" is all about. Exploring the four Reserve sites you too will find out why these estuarine areas (the places where salty ocean waters and fresh inland waters mix) are special — and so important to protect.

That's a topic on which Dave Owens, the director of the Division of Coastal Management and chief architect of the reserve program, is particularly clear. "Estuaries are the foundation of life in North Carolina's coastal area. If we lose them we lose wildlife, fisheries, recreation, traditional livelihoods. By the early '80s that was a real possibility. It became a question of acting quickly or forever losing the opportunity to save these areas. We chose to act."

With a federal grant and the donation of what would become the Reserve's Zeke's Island site, in 1982 the state established the Reserve. It is part of the National Estuarine Reserve Research System created by Congress in the 1970s to preserve endangered estuarine areas for research and education.

By 1985, the Currituck Banks, Rachel Carson and Zeke's Island sites had been acquired, and the purchase of the Masonboro Island site had begun. (Acquisition of Masonboro Island is expected to take a few years because of the complicated patterns of ownership, but most of the southern part of the island belongs to the state.) Today the division manages more than 112,000 acres of barrier islands, salt marshes and sounds — some of the most important wildlife habitat in the state. Many parts of the sites are totally undisturbed, and the Masonboro Island and Currituck sites are virtually pristine.

As Dave Owens puts it, "Not only have we kept some critical natural areas from being damaged or destroyed, we have preserved places where people can see and appreciate undeveloped coastal areas. That is an increasingly unusual experience along the East Coast."

Hundreds of visitors come to the sites each year.

***The deserted beaches** of Masonboro Island estuarine reserve (left) offer excellent nesting habitat for loggerhead sea turtles. Volunteers use all-terrain vehicles to check the beaches for turtle crawls. The island is one of four national estuarine research reserves located in North Carolina. Starfish (above) are common at "the rocks" on Zeke's Island, an estuarine reserve located at the mouth of the Cape Fear River.*

JIM PAGE

Education and research *are both important uses of estuarine reserves. At Rachel Carson reserve (above), children learn about salt marshes first hand. Nesting loggerhead sea turtles on Masonboro Island (below) provide important research data for biologists. Development of barrier islands has hurt these threatened creatures.*

KEN TAYLOR

Some are scientists studying estuarine processes. Many are students learning about the coast. Most go to collect shells, bird watch, fish and enjoy themselves. Reserve Coordinator John Taggart thinks that the Reserve offers a unique opportunity to show visitors what the coast is all about.

"You can talk about nature and the environment, but unless you can show what's so special, it's tough to really convince someone that protecting an estuary is important," he says. "You hear it said that 95 percent of the commercial seafood species caught in North Carolina depend on estuaries for some part of their lives. But that statistic really comes to life when you're standing in the water at one of the Reserve sites watching shrimp and fish swim back and forth."

When visitors to the Rachel Carson site find live sand dollars in the shallow waters and ask, "Why isn't this white?" they find out that the living animals are red; "white" sand dollars are actually bleached skeletons. Sea shells often provide a similar surprise: many visitors are caught off guard when they discover a living animal inside the shell. Such simple, seemingly insignificant, experiences are really the starting point for learning about coastal systems.

Owens and Taggart think that coastal resources will be better protected as visitors to the Reserve learn more about coastal natural areas. What you will find when you visit the Reserve sites — and really get your feet wet, so to speak — is a remarkable community of life.

Drive north a few miles from the popular Dare County beaches and you will find the Currituck Banks site, remote and undisturbed; a mosaic of dunes, swales, marshes and forest between Currituck Sound and the Atlantic Ocean. For many marine creatures that live along the East Coast, this area is the farthest north or south that they can survive. Visit the site during winter and you'll be overwhelmed by the thousands of ducks, geese, swans and other migratory birds at this important stop along the Atlantic Flyway.

Traveling south down the Intracoastal Waterway you will come to Beaufort and the Rachel Carson site. The complex of marshes, tidal flats and artificially created dredge spoil islands that compose the site named for Rachel Carson (who did research there in the 1940s) is a popular spot for bird and horse watching. More than 160 species of birds have been sighted there, and feral horses graze on the site's marsh grasses. Wild asparagus grows there in the spring, and the Atlantic bottlenose dolphins

KEN TAYLOR

Manmade spoil islands *created by dredging marshes and tidal flats make up the Rachel Carson estuarine reserve near Beaufort (left). The famous biologist studied coastal ecology here in the 1940s before writing her best seller* Silent Spring, *which exposed the dangers of pesticides to wildlife. Royal terns (above) and many other shorebirds nest on the Rachel Carson estuarine reserve.*

N.C. COASTAL RESOURCES

***The jetty at** the Zeke's Island estuarine reserve (above) was built shortly after the Civil War, and harbors marine life that is normally found along the rocky coast of New England.*

often swim in the waters around the site.

Not far from Wilmington you will discover one of the coast's most spectacular sights at low tide: the seemingly endless salt marshes and tidal flats of the Masonboro Island site. Almost 9 miles long, the island is the largest undisturbed barrier island along the southern part of the North Carolina coast. Perhaps the site's most impressive visitor is the federally protected loggerhead sea turtle. Weighing as much as 300 pounds, the female turtles come ashore on summer nights to nest, then return to the sea. In the fall the tiny hatchlings break out of the nests and attempt to reach the ocean without being eaten by birds and raccoons.

The southernmost Reserve site is Zeke's Island, where you will see how significantly human activities can affect coastal systems. There "the Rocks" — a large jetty built after the Civil War — created a lagoon now called "the Basin." The jetty blocks the flow of the Cape Fear River through the estuary, increasing the salinity of the lagoon and changing the surrounding lands. Because of the jetty, you will be able to see organisms such as barnacles and limpets that are more at home on a rocky shoreline like Maine's. The site is also one of the most important bird habitats in the coastal area.

Trips to the Reserve sites (see the sidebar for details) are an important part of the Reserve's education program, a cooperative effort of several agencies. The North Carolina Aquariums and the North Carolina Maritime Museum both sponsor field trips to the sites, and educational projects and publications produced by the division with the UNC Sea Grant Program and the Department of Public Instruction help increase understanding of estuaries. The joint efforts enable the division to provide many more educational opportunities while protecting additional natural areas.

The Reserve's research program, which provides some federal funding for studies, encourages research projects that will produce the technical information needed to make sound decisions about using coastal resources. The projects include studies of the geology of Masonboro Island and the decline of eelgrass along the East Coast. The North Carolina Reserve staff exchanges information about research and education activities with the other 16 reserves within

the National Estuarine Reserve Research System.

Despite the accomplishments of the reserve program, Owens and Taggart consider them to be just the foundation for more extensive efforts to educate people and provide research opportunities. "Now that the sites are established and basic education and research programs are underway, we can begin to build more sophisticated programs," Owens says.

Owens is also concerned about continuing to protect critical natural areas: since 1983 the number of permits issued for development projects in environmentally sensitive areas has tripled. "Every day we receive applications to develop even remote areas," he says. "Just like the old wisdom about hurricanes, it's not if development will occur but when. So the need to preserve important areas hasn't gone away."

As a result, in 1987 the state created the North Carolina Coastal Reserve to protect all the estuarine reserve sites and other natural areas that could not meet the selection guidelines of the estuarine reserve.

Permuda Island, which has nationally significant archaeological resources and is surrounded by economically important shellfishing waters, is one of these areas. Not even the stringent environmental safeguards the division would have imposed on development there could have guaranteed the integrity of the area. Recognizing the island's importance, in 1986 the North Carolina Nature Conservancy purchased the island and then sold it to the state to become part of the Coastal Reserve.

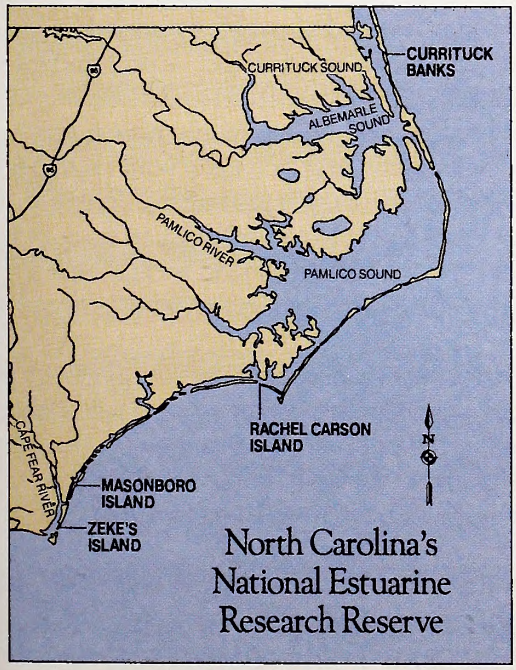
The Coastal Reserve also includes part of the Buxton Woods. Like Permuda Island, Buxton Woods is extremely vulnerable to the effects of development. The 3,000-acre maritime forest on Hatteras Island is the largest example of this unique — and rapidly vanishing — ecosystem in North Carolina. The first tract of 150 acres was purchased at the end of 1987, and further acquisitions are expected during 1988.

Owens likes to think of the Reserve not as the culmination of several years' work, but as a starting point and model for other natural area acquisition programs. "The estuarine reserve program has worked well," he says. "Now we need to create more programs like it. We need to make a commitment to preserve our natural heritage — with stable funding for acquisition of important natural areas throughout the state. That's a key to protecting the health and quality of our environment." ⊠

N.C. COASTAL RESOURCES

***Feral horses** (above) eke out a harsh life on the Rachel Carson estuarine reserve. The animals find fresh water by digging depressions with their hooves in low spots between the dunes.*

Visiting The Reserve



For information about field trips to Currituck Banks, Rachel Carson, Masonboro Island and Zeke's Island, contact one of the organizations below.

Currituck Banks: N.C. Aquarium at Roanoke Island, (919) 473-3493.

Rachel Carson: N.C. Aquarium at Pine Knoll Shores, (919) 247-4003; N.C. Maritime Museum, (919) 728-7317.

Masonboro Island and Zeke's Island: N.C. Aquarium at Fort Fisher, (919) 458-8257.

For additional information about the Reserve, write or call the Division of Coastal Management, N.C. Department of Natural Resources and Community Development, Box 27687, Raleigh, N.C. 27611; (919) 733-2293. A general Reserve brochure and a trail guide for the Rachel Carson site are available free of charge. A field guide for the entire Reserve may be purchased for $2.50.

There are three things a boat-owner may need when a hurricane or bad storm strikes — plenty of insurance, a hurricane plan, and a good friend.

That, in a nutshell, is the advice of Jim Bahen, a man who ought to know. Bahen is a North Carolina Sea Grant agent from Wilmington, and has worked as a commercial fisherman and charter boat captain. He's had plenty of first-hand experience preparing boats for heavy weather.

BAD WEATHER AND BOATS

Your boat has a better chance of surviving a hurricane or bad storm if you know what to do in advance.

by Mark Taylor

"Even a small sport fishing boat can cost $10,000 or more, and many boaters consider their craft their most prized possession," said Bahen. "We've had several hurricanes threaten our coast in the past few years, and boaters should know how to protect their craft. Strong winds, and especially the high water or storm surge that accompanies hurricanes, can easily damage or sink a boat. We usually have only a few days notice before a hurricane strikes, so there's not much time to get your boat ready. With a little planning and preparation, however, it's much easier to protect your boat. Also, many of the same measures will prevent damage from sudden squalls and northeasters."

The first step Bahen advises is to be sure that all boats — even small craft — are covered fully by an insurance policy. This will not only protect your boat from storm damage, but also covers collisions, fire, vandalism and theft.

It's also important to have a hurricane plan, a written checklist of the steps needed to protect your boat.

Finally, a boater needs a good friend — preferably one who lives near the boat.

"You'll enjoy fishing and sailing much more if you have some good company, and in return your friend can care for your boat if necessary," said Bahen. "This is especially important if you live more than an hour from where your boat is docked. Your friend should have a copy of your hurricane plan and keys to your boat and trailer.

"It's also a good idea to leave spare keys and a copy of your hurricane plan with the marina owner," said Bahen. "However, the marina phone will be ringing off the hook before a hurricane, and the owner may not have much time. That's why it's important to have a friend nearby who can look after your boat."

The hurricane plan for your craft will vary depending on the size of the boat and where it's kept. Following these guidelines, however, will help your boat weather the storm.

***A sailboat docked** at Wrightsville Beach is tossed by an October storm which damaged or sank many boats in 1982. Preparing your boat properly for rough weather will help it weather strong storms and even some hurricanes with minimal damage.*

Big Game Tag Report Number 12

. . . a summary of North Carolina's big game harvest for 1987-88 as reported by hunters to Wildlife Cooperator Agents

Why should a hunter go out of his way to tag and report the turkey gobbler he just shot? How many deer were harvested during the season here in North Carolina? Was the total deer harvest for this period greater or less than this figure for last season? How is this information used? These are questions that often surface during discussions of North Carolina's big game tagging system. The big game tagging system is a reporting procedure which requires that all wild turkey, boar, bear and deer which are harvested by hunters here in the state be tagged at the site of harvest and that certain information be reported to any one of approximately 1,500 Wildlife Cooperator Agents for later collection by the Wildlife Resources Commission. This procedure became mandatory in the fall of 1976. Successful game management is based on many factors and individual pieces of information, including in this case, big game harvest figures. The more a game manager knows about population trends and numbers, the easier it is for him to make decisions affecting seasons, bag limits and other regulatory matters. Sound big game management must be the result of the combined efforts of sportsmen and the staff of the Wildlife Commission. While the figures in this report represent the reported harvest and may vary from the actual harvest, they are the best such figures available at this time. Please do your share to see that future reports of this nature are as complete as possible by tagging and reporting your big game harvests and by encouraging your fellow sportsmen to do the same.

If you have questions about the procedures or this report, please contact the Division of Wildlife Management, North Carolina Wildlife Resources Commission, 512 N. Salisbury Street, Archdale Building, Raleigh, North Carolina 27611.

1987-88 Reported Black Bear Harvest

County	Male	Female	Total	Game Land	Other Land	Unk. Land	Rifle	Shot-gun	Hand-gun	Gun Unk. Or Other
Avery	3	1	4	4			4			
Beaufort	11	9	20		16	4	19			1
Bladen	14	14	28	2	22	4	14	13		1
Brunswick	17	5	22		22		16	3	3	
Buncombe	3	4	7	1	6		7			
Burke	8	1	9	5	2	2	9			
Caldwell	6		6	1	4	1	5		1	
Carteret	2	4	6	3	2	1	2	4		
Cherokee	35	16	51	44	3	4	45	6		
Clay	8	9	17	15	1	1	14		2	1
Columbus	3	3	6		5	1	4	2		
Cumberland	3		3		3			2	1	
Duplin		1	1		1		1			
Graham	28	18	46	42	2	2	40	3	2	1
Haywood	23	11	34	20	13	1	29	3	1	1
Henderson	1	2	3		3		3			
Hyde	46	16	62		60	2	57	1	3	1
Jackson	6	2	8	7		1	8			
Jones	9	3	12	3	9		10	1		1
Macon	31	8	39	38		1	39			
Madison	16	3	19	17	2		18		1	
McDowell	22	5	27	20	7		17	6	3	1
New Hanover	2	2	4		4		3			1
Onslow	13	3	16		15	1	11	5		
Pamlico	8	3	11		11		9	1		1
Pender	14	11	25	4	19	2	22	1	1	1
Rutherford	5		5		5		5			
Sampson	2		2		2			1		1
Swain	12	4	16	15	1		15	1		
Tyrrell	17	8	25	1	22	2	21	2		2
Washington	9	1	10		9	1	10			
Watauga	1		1		1		1			
Yancey	12	4	16	1	14	1	14	2		
Totals	390	171	561	243	286	32	472	57	18	14

1987-88 Reported White-Tailed Deer Harvest

County	Sex Harvested				Antlered Bucks Per Sq. Mile*	Weapon					Location	
	Antlered Bucks	Button Bucks	Does	Total		Shotgun	Rifle	Muzzle-loader	Bow	Hand-gun	Game Lands	Other Lands
Alamance	342	21	67	430	1.79	73	271	54	28	2		430
Alexander	143	12	33	188	0.86	9	122	23	30		2	186
Alleghany	506	66	212	784	4.18	14	472	113	181	2		784
Anson	839	123	414	1,376	2.38	259	891	123	88	5	30	1,346
Ashe	413	50	190	653	1.69	4	407	126	114	2	12	641
Avery	48	5	11	64	0.26	2	41	6	15		49	15
Beaufort	1,535	104	635	2,274	3.25	154	1,976	72	22		79	2,195
Bertie	1,517	174	926	2,617	3.05	1,670	807	49	27	6	44	2,573
Bladen	2,217	145	711	3,073	3.33	1,662	1,248	68	34	6	90	2,983
Brunswick	1,341	109	564	2,014	2.07	1,500	413	47	13	1	31	1,983
Buncombe	190	21	111	322	0.45	8	283	11	13		39	283
Burke	647	61	246	954	1.68	39	702	52	140	2	206	748
Cabarrus	28	3	1	32	0.18	21	2	2	5			32
Caldwell	369	30	72	471	1.03	15	367	22	57		153	318
Camden	187	3	18	208	1.30	112	85	2	3	1		208
Carteret	400	36	204	640	1.33	215	355	38	15	2	73	567
Caswell	1,307	226	685	2,218	5.01	929	967	170	128	4	240	1,978
Catawba	124	21	51	196	0.78	7	134	14	40			196
Chatham	1,058	111	358	1,527	2.25	222	975	155	154	7	349	1,178
Cherokee	15			15	0.04	2	13				12	3
Chowan	541	73	309	923	6.60	354	478	32	28	3		923
Clay	55		1	56	0.31	1	51	1	2		42	14
Cleveland	139	7	36	182	0.67	13	152	6	5	2	9	173
Columbus	1,569	59	353	1,981	2.41	1,223	604	69	20	4		1,981
Craven	1,680	100	491	2,271	3.39	429	1,642	98	39	6	131	2,140
Cumberland	830	90	451	1,371	2.26	183	1,076	56	45	4		1,371
Currituck	243	15	58	316	2.29	133	161	4	15		2	314
Dare	134	3	10	147	0.51	55	62	8	19	2	87	60
Davidson	543	67	222	832	2.10	55	587	81	100	1	34	798
Davie	277	10	64	351	2.50	10	220	73	45			351
Duplin	870	53	246	1,169	1.89	517	607	9	9	1	8	1,161
Durham	181	25	117	323	1.18	179	106	14	18	1	140	183
Edgecombe	1,374	140	662	2,176	5.54	809	1,161	82	58	3		2,176
Forsyth	31		1	32	0.22	3	22	5	2			32
Franklin	920	84	231	1,235	3.30	786	378	25	20	2	51	1,184
Gaston	25	1	5	31	0.15	6	12	3	8	1		31
Gates	1,345	341	1,175	2,861	5.56	2,222	512	46	20	10	37	2,824
Graham	29		1	30	0.11	1	24	1	3		25	5
Granville	1,050	94	363	1,507	3.19	508	806	93	88	2	164	1,343
Greene	135		2	137	1.10	54	79	1	2			137
Guilford	149	8	31	188	0.61	42	115	16	11			188
Halifax	1,871	290	1,222	3,383	4.62	1,091	1,968	129	88	10	28	3,355
Harnett	154	4	3	161	0.46	79	63	11	7		1	160
Haywood	146	5	13	164	0.36	2	130	6	25		136	28
Henderson	111	3	7	121	0.49	4	96	6	13		65	56
Hertford	573	118	398	1,089	2.46	899	163	4	1	1		1,089
Hoke	97	1	2	100	0.39	85	13		1			100
Hyde	866	162	592	1,620	2.49	320	1,072	137	56	2	51	1,569
Iredell	413	3	85	532	1.66	19	342	106	60	1		532
Jackson	14			14	0.03	1	13				14	0

1987-88 Reported White-Tailed Deer Harvest

County	Sex Harvested				Antlered Bucks Per Sq. Mile*	Weapon					Location	
	Antlered Bucks	Button Bucks	Does	Total		Shotgun	Rifle	Muzzle-loader	Bow	Hand-gun	Game Lands	Other Lands
Johnston	291	15	66	372	0.73	88	247	15	17			372
Jones	1,453	136	645	2,234	4.08	275	1,824	83	19	1	102	2,132
Lee	180	1	2	183	1.09	21	135	17	5	3	24	159
Lenoir	435	24	120	579	2.28	74	484	9	1	1	2	577
Lincoln	37	1	3	41	0.26		26	7	7			41
Macon	118	2	6	126	0.27	6	107	1	10		110	16
Madison	108	7	21	136	0.32	3	88	13	30		85	51
Martin	1,004	56	337	1,397	3.51	917	420	27	13		8	1,389
McDowell	294	16	39	349	0.81	12	239	31	58	1	196	153
Mecklenburg	44	5	21	70	0.19	40	1	13	14			70
Mitchell	116	5	10	131	0.72	1	93	12	18		36	95
Montgomery	1,380	186	636	2,202	3.53	245	1,410	275	238	7	316	1,886
Moore	198	14	38	250	0.38	177	62	6	1		12	238
Nash	351	16	70	437	1.27	160	247	7	9			437
New Hanover	92	10	63	165	0.91	75	76	10	2		1	164
Northampton	1,834	240	971	3,045	5.75	1,455	1,360	90	46	6	11	3,034
Onslow	1,449	131	634	2,214	2.71	1,196	804	57	73		62	2,152
Orange	492	42	139	673	2.19	171	373	83	42	2	8	665
Pamlico	576	19	128	723	3.03	69	600	30	10		3	720
Pasquotank	141	3	5	149	1.72	61	84		2			149
Pender	1,610	165	783	2,558	2.25	1,094	1,306	44	39	5	73	2,485
Perquimans	424	35	125	584	3.62	231	325	2	9			584
Person	695	48	207	950	3.22	386	479	45	31	2	38	912
Pitt	981	78	335	1,394	3.22	195	1,113	36	20	3		1,394
Polk	180	4	15	199	1.01	2	155	13	17		95	104
Randolph	542	59	128	729	1.14	68	505	70	82	1	40	689
Richmond	661	72	315	1,048	1.87	653	319	32	9	5	95	953
Robeson	450	27	163	640	1.03	439	178	9	5		1	639
Rockingham	495	53	138	686	1.63	99	424	63	91	2		686
Rowan	370	38	136	544	1.66	50	340	67	82	3	33	511
Rutherford	484	19	108	611	1.21	17	524	26	33	1	108	503
Sampson	866	45	217	1,128	1.61	400	668	14	16	1		1,128
Scotland	379	5	26	410	2.05	318	58	1	24		108	302
Stanly	427	27	144	598	2.60	86	334	70	99		6	592
Stokes	160	5	26	191	0.60	25	105	24	36		4	187
Surry	161	8	37	206	0.59	18	133	21	34			206
Swain	10			10	0.02		6	2	2		7	3
Transylvania	113	1	8	122	0.34	4	98	7	11	1	67	55
Tyrrell	253	1	1	255	1.02	33	188	20	1		14	241
Union	61	1		62	0.23	8	49	4	1			62
Vance	397	12	69	478	2.86	171	262	24	9	1	19	459
Wake	176	10	23	209	0.40	41	148	7	10	1	46	163
Warren	975	170	680	1,825	3.28	1,281	484	16	15	2	43	1,782
Washington	268	26	75	369	1.74	106	211	24	21		2	367
Watauga	51		4	55	0.27		35	13	7			55
Wayne	108	6	21	135	0.45	29	96	7	3			135
Wilkes	688	40	164	892	1.24	15	567	129	176	3	82	810
Wilson	46			46	0.29	24	21					46
Yadkin	188	2	9	199	1.38	10	120	42	25		2	197
Yancey	240	11	43	294	0.93	1	187	39	59	1	122	172
State Total	52,647	5,005	20,613	78,265	1.78	27,850	41,368	3,927	3,498	149	3,504	74,761

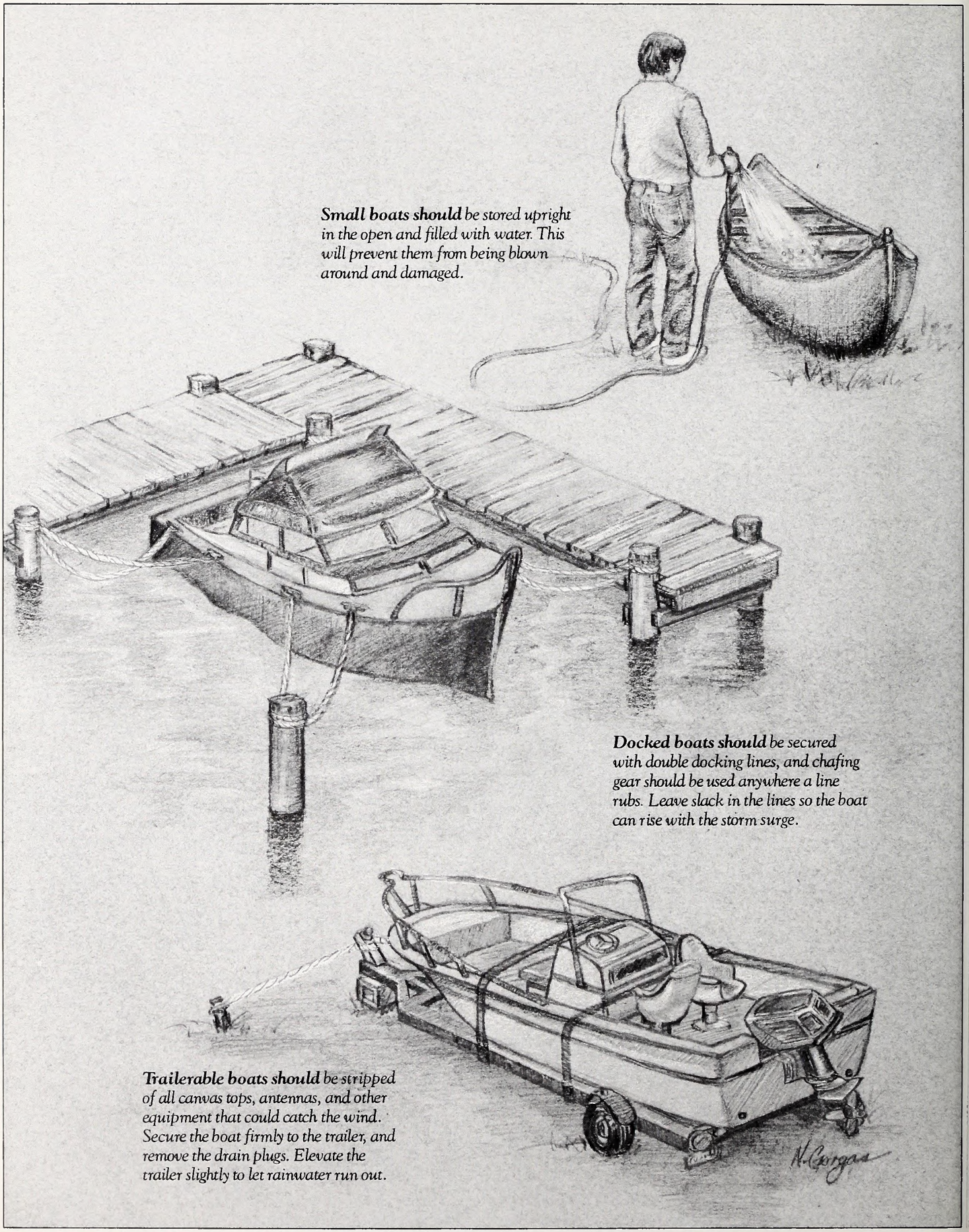
*Square miles of forest as index of deer habitat.

1987-88 Reported Wild Boar Harvest

County	Male	Female	Total	Game Land	Other Land	Unk. Land	Rifle	Shot-gun	Hand-gun	Gun Unk. Or Other
Alleghany	2		2			2	2			
Avery		1	1	1			1			
Burke	1	1	2	2					2	
Cherokee	10	6	16	14	1	1	9	5		2
Clay	2		2	1	1		1		1	
Graham	50	44	94	84	6	4	84	6	1	3
Macon	3	2	5	5			5			
Rutherford	1	1	2		2		2			
Swain	3	2	5	3	2		4	1		
Totals	72	57	129	110	12	7	108	12	4	5

1987 Reported Wild Turkey Harvest

		Age			Location			Weapon Used		
County	Total Reported	Adult	Juvenile	Unk.	Game Land	Other Land	Unk. Land	Shotgun	Bow	Unk.
Alamance	12	11	1			12		12		
Alleghany	32	25	7			32		32		
Ashe	60	35	25		1	47	12	60		
Bertie	54	46	8			49	5	53		1
Buncombe	3	3				3		3		
Caswell	173	153	19	1	32	141		168		5
Chatham	18	17	1		2	14	2	17		1
Cherokee	20	18	2		19	1		20		
Clay	12	11	1		12			12		
Columbus	1	1				1		1		
Durham	1	1			1			1		
Franklin	2	2			1	1		2		
Graham	5	5			2	1	2	5		
Granville	8	7	1		1	7		7		
Halifax	13	9	4			13		13		
Haywood	1	1			1			1		
Henderson	7	7			6	1		7		
Jackson	3	3			3			3		
Jones	2	2			1	1		2		
Macon	30	25	5		24	4	2	30		
Madison	12	10	2		10		2	10		2
Martin	37	29	8			37		35		2
McDowell	7	7			7			6		1
Montgomery	14	13	1		5	9		13	1	
Moore	5	5				5		5		
Northampton	12	11	1			11	1	11		1
Onslow	20	17	3			19	1	20		
Orange	8	6	2			8		8		
Person	57	55	2		2	47	8	54		3
Randolph	1		1		1			1		
Richmond	19	17	1	1		19		19		
Robeson	2	2				2		2		
Rockingham	7	4	3			7		7		
Swain	3	3			2	1		2		1
Transylvania	9	6	3		7	1	1	9		
Vance	2	2				2		2		
Warren	3	3			1	1	1	3		
Watauga	4	4				4		4		
Wilkes	1	1				1		1		
Totals	680	577	101	2	141	502	37	661	1	18



Small boats should *be stored upright in the open and filled with water. This will prevent them from being blown around and damaged.*

Docked boats should *be secured with double docking lines, and chafing gear should be used anywhere a line rubs. Leave slack in the lines so the boat can rise with the storm surge.*

Trailerable boats should *be stripped of all canvas tops, antennas, and other equipment that could catch the wind. Secure the boat firmly to the trailer, and remove the drain plugs. Elevate the trailer slightly to let rainwater run out.*

BAD WEATHER AND BOATS

Small Portable Boats

Small boats — such as jonboats, dinghys, skiffs, canoes, and some sailboats — should be removed from the water. If they cannot be stored in a building, the following steps will prevent wind damage.

— Carry the boats to high, open ground. Remove all loose gear such as oars, paddles, sails and rigging. Set flat-bottomed boats right-side up on the ground, and fill with water. This will not harm the boat, and will prevent it from being blown away by the wind. Lightweight V-bottom boats may be propped up level with chocks or placed on a small trailer before being filled.

— Small, decked sailboats — such as a Sunfish — have very small cockpits, and won't hold much water. Remove all rigging (sails, mast and boom, rudder and centerboard) from these boats and store these items inside. Lash the hull securely to a sturdy fence, or use large tent stakes and line to peg the upside-down hull to the ground.

— Avoid leaving boats under or near large trees which could fall on the boat or drop limbs on it.

Trailerable Boats

Most boats under 25 feet can be trailered, and it's best to remove them from the water. If possible, store the boat in a closed garage. If the trailered boat must be left outside, however, take the following steps.

— Be sure you own or have access to a well-maintained trailer. Be sure the hubs and bearings are greased, brakes and lights are working, a spare tire is available, and that the tires are fully inflated and in good condition. If a hurricane is approaching, you won't have time to fix your trailer and boat, too.

— Park the trailered boat in a sheltered spot — such as behind a building. Watch for trees, though.

— Take all loose equipment — such as electronics, coolers, fuel tanks, fishing equipment, seat cushions, and life jackets — from the boat and store inside.

— Disconnect the battery cables from the battery terminals. This will prevent problems with electrolysis if water covers the battery, and should be done anytime a boat is not in use.

— Strip the deck and rigging of anything the wind could catch. Remove all canvas tops, sails, portable windshields, antennas, and such.

— Secure the boat to the frame of the trailer with the hold-down and an extra strap. Use elastic tie-downs to secure the lowered masts and rigging of sailboats.

— Prop the tongue of the trailer up on blocks. Leave the boat uncovered, and leave the motor attached to the transom. Remove the drain plugs so that rainwater will drain from the boat. The weight of the boat will keep it in place, but as an extra precaution you may use stakes and line to secure the tongue of the trailer so it won't blow off the support blocks.

Leaving Your Boat At Its Slip

If you own a large sailboat or powerboat, or don't have access to a trailer, you may have to leave the boat in its slip. Docked boats are not only susceptible to wind damage, but also need to be protected from the high water associated with hurricanes. A hurricane will push a large mound of water before it, and this "storm surge" is responsible for most of the property damage and deaths associated with hurricanes. The storm surge can raise water levels as much as 10 feet above normal.

The following steps will help protect your boat from wind and water damage.

— Remove all loose gear from the cockpit and cabin, and strip the deck of anything that could catch the wind. Remove all sails (including roller-furling sails) and secure loose rigging.

— Remove perishables from the boat. Shore-based power will probably go off for several days.

— Check your battery and bilge pumps regularly. Be sure your battery is always well-charged, and your bilge pump is working. Heavy seas and rain will dump a lot of water into the boat, and a working bilge pump is a must. Double check to be sure that the automatic bilge pump switch is working and left on.

— Close all hatches and compartments, and be sure they are watertight. If in doubt, seal the seams with duct tape.

— Secure the boat as you normally would using existing bow and stern and spring lines (which should be inspected regularly, and kept in good condition). However, allow plenty of slack in the lines so the boat can rise with the storm surge and move within the slip as the winds shift. If your boat is tied too tightly, it can be sunk by its own lines.

— Keep an extra set of hurricane lines on the boat which duplicate your normal docking lines. Hurricane lines ought to be heavier than your regular lines, and of course they should be in good condition.

— Use your hurricane lines to double all lines. Tie them as you normally would, but if possible secure them to different cleats or pilings. Also, be sure to allow for the storm surge..

— Place fenders along both sides of the boat. This will prevent the boat from rubbing against the dock, or being damaged by a loose boat.

— Apply chafing gear to all docking lines. This should be done anywhere a line rubs the boat, dock, cleats or pilings. Even the strongest lines can quickly chafe or wear through in a storm. Encasing lines in short lengths of garden or neoprene hose prevents chafing, or you may simply wrap towels or rags with twine around friction points on lines.

— If you're tied to a dock or slip that lacks outboard pilings, setting anchors at a 45-degree angle off the bow and stern will hold the boat off the dock.

Moving Your Boat To A Hurricane Hole

Commercial fishermen and owners of large boats often move their boats to sheltered waters called hurricane holes when a hurricane threatens. This approach, however, has its pros and cons.

"I think most recreational boaters are much better off leaving a boat in its slip and securing it well," said Bahen. "You can lose a lot of time moving your boat, and hurricane holes are apt to be crowded. If you don't find a good spot, you're in much worse shape. Also, if an anchored boat breaks loose in a hurricane hole, it can damage or sink other boats. Boats secured in slips are often better protected."

If you do choose to move your boat to a hurricane hole, however, take the following steps.

— Make arrangements with property owners beforehand.

— Know how long a run it is to your hurricane hole, and allow plenty of time. Avoid routes which pass under drawbridges —they may not raise if evacuation of coastal areas has begun.

— Whether you tie up to the shore, a dock, barge or anchor will depend on the site. Know in advance how you will secure your boat, and have on board all of the lines and other gear you will need.

Your boat is secure, and the hurricane is approaching. What's next?

"The best thing to do is turn your back and leave," said Bahen. "You've done the best you can, and there's nothing more you can do to save your boat when the storm hits. Take your family and head for safer areas inland. A boat can be fixed or replaced. You can't." ⊠

The following publications may be ordered from the North Carolina Sea Grant program, N.C. State University, Box 8605, Raleigh, N.C. 27695-8605: Hurricane Preparedness Poster *(UNC-SG-86-08), $1;* About Hurricanes *(UNC-SG-85-07), free;* Safety Checklist Blueprint *(UNC-SG-BP-82-03), free.*

The Land Nobody Wanted

Linville Gorge is the deepest gorge east of the Mississippi River, a priceless wilderness spared at least partly because it was considered too inaccessible to be developed.

by Kay Scott

Shouldering our daypacks that cool August morning, my two companions and I began the three-quarter mile trek to the highest point in the Linville Gorge Wilderness Area — Hawksbill Mountain. It was early; only a hint of light filtered across the eastern sky. The last morning star was shining brightly. Our goal — to hike to the summit for a sunrise breakfast.

We checked our daypacks before leaving the car at the access area on Forest Service Road 210, just south of Gingercake Acres. Despite the fact that it was only a short hike on a clear, summer morning, we carried warm clothing and raingear in addition to our breakfast, map and compass, water, first aid kit and flashlight. We knew the unpredictable nature of the weather on these mountain summits and wanted to be prepared.

Leaving the access area, we pushed steadily upward along the steep trail. We could see our breath pouring forth a warm, wet mist in the cool air. Finally, the trail leveled and, almost three-quarters of the way to the summit, we made a sharp swing to our left. We found ourselves scrambling over the rock strewn trail. The sound of wind gusting around the face of the jagged rocks at the summit called to us. The layered rocks form a pattern which, when viewed from a distance, look like the head and bill of a hawk.

As we crested the summit, we had a few minutes left before sunrise. Clouds hung around many of the mountain faces which surrounded us. To the northeast, the rugged summit of Grandfather Mountain stood shrouded in mist. To the south, we could look down the eastern rim of Linville Gorge to Table Rock Mountain. "Attacoa" to the Cherokee, this mountain certainly looked like a mystic altar that morning. I could understand why the Indians who used this gorge as a summer home in the 1700s might have felt that Table Rock was a sacred site. Beyond Attacoa, the sheer cliffs of Shortoff Mountain faded against the eerie shimmering backdrop of Lake James.

We focused our attention east to find the wind rising around us in anticipation. Then, the sun broke through the clouds, ushering

***Looking south from** the western rim of Linville Gorge at Wiseman's View, the Linville River carves a deep notch south to its eventual union with Lake James. Access into this wilderness is limited and requires a steep hike — one reason the area has remained largely in its natural state.*

TRAVEL & TOURISM

in the new day. A Jacob's Ladder formed as light streamed through the clouds. It almost seemed that we could walk into the heavens on that ladder of light. We watched in fascination as the sun finally poured over the hawk's bill, into the waiting gorge below. As we slowly ate our cold breakfast, we feasted on the spectacle of the new day brightening "the land that nobody wanted."

Indeed, that's what Linville Gorge was once considered. The deepest gorge east of the Mississippi, its rocky walls falling almost 2,800 feet into the winding Linville River, Linville was an area so steep and wild that it was of little use to early settlers. At best, it provided a summer grazing grounds for livestock.

In 1938 the U.S. Forest Service acquired Linville Gorge under the authority of the Weeks Act which authorized the acquisition of federal lands for timber production and to protect the headwaters and watersheds of navigable streams. The Forest Service recognized the unique character of the gorge early. By the 1950s the 10,975 acres of land was assigned an in-house designation as a "Wild Area." This limited timber harvesting and protected the unique natural beauty.

In September 1964, more than 7,000 acres of the gorge were designated by Congress as one of the first two wilderness areas in the eastern United States. (The other was the Shining Rock Wilderness Area in western North Carolina.) In 1984, the North Carolina Wilderness Act added 3,400 acres to the wilderness, including the land around Hawksbill Mountain where we stood that morning.

According to Mike Anderson, District Ranger for the Grandfather District of Pisgah National Forest, this Congressional designation means that the wilderness quality of this area is preserved forever. In practical terms it means that the Forest Service manages this area so that there is no timbering, no use of motorized equipment of any kind and that the wilderness resource and experience is preserved and protected.

That morning, the gorge looked wild and untamed. From my lofty vantage point, it appeared that no man had scarred this segment of the earth. But then I remembered a backpacking trip I had taken in the gorge the previous spring. That hike had shattered my illusions about this "paradise" and had given me a few indications of the real challenges facing both the Forest Service and all users of this wilderness area.

On that April day, I had the opportunity to explore about 6 miles of land along the shining river. My three companions and I had journeyed to the western rim of the gorge, directly across from Hawksbill.

Access to the western side is from the Kistler Memorial Highway. The name is misleading; this "highway" is a rough dirt road that is not recommended for two-wheel drive vehicles in bad weather. It parallels the wilderness boundaries south from N.C. 183 near the town of Linville Falls.

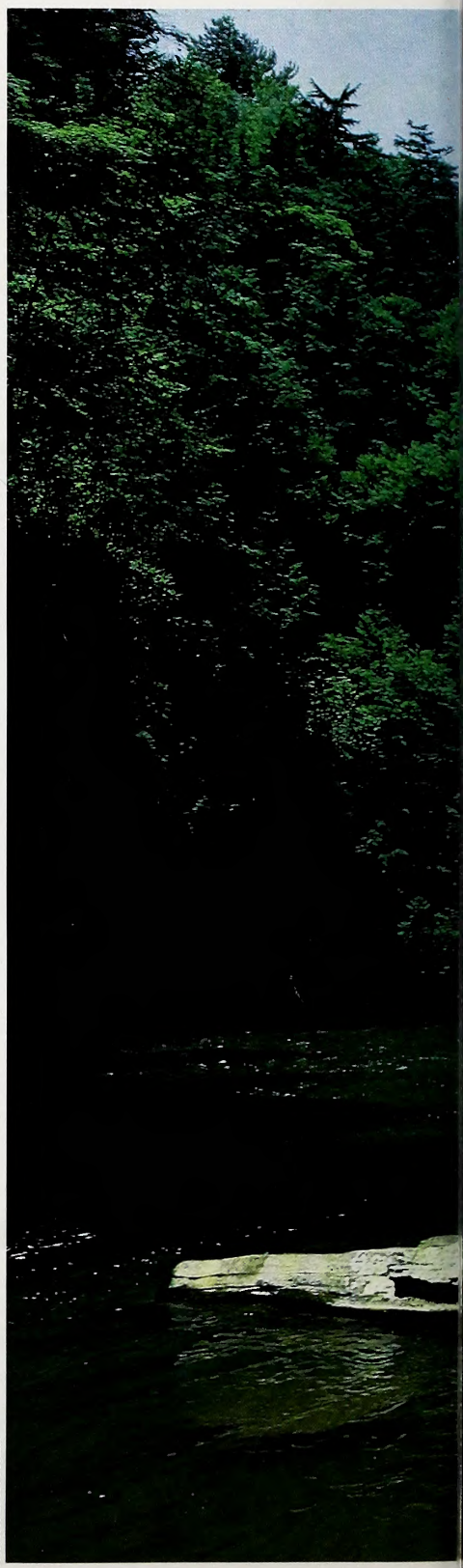
Six-tenths of a mile from the road's beginning, we passed the gorge information station. During the summer, this station is staffed by older Americans as part of a program for people 55 years old and above. They provide specific information about campsites, fishing opportunities, trail conditions and plant and animal life. In addition, they also perform some trail maintenance and clean-up.

The cabin is a popular stop for visitors to this area. According to Anderson, during 1986 more than 7,000 visitors from 40 different states and eight foreign countries registered their visit with the attendants.

Six parking areas along the Kistler Memorial Highway provide access to the eight trails which lead from this western rim into Linville Gorge. In addition, this road provides access to Wiseman's View, the only overlook of the gorge. (The short trail from the parking area to the overlook is handicapped-accessible. It offers many who would be unable to travel these steep trails the opportunity to enjoy this spectacular view of the wilderness.)

Our group left a shuttle car at one of the first parking areas so that we wouldn't have to hike out and back along the same trail. We had found that permits *are* necessary for camping in the gorge on weekends and holidays from May 1 through October 31. During that period, overnight use in the gorge is limited to 50 visitors in order to preserve the quality of the wilderness experience. According to Anderson, "With each passing year, the Forest Service finds itself faced with the increasing challenge of managing people in order to protect the wild character of this area. This 50-visitor limit keeps people from loving the gorge to death."

We had a map and compass (and knew how to use both), a flashlight, knife, first aid kit, waterproof matches, extra food, warm clothing, rain gear, tents, sleeping bags, backpacking stoves, iodine and water. In addition,



N.C. TRAVEL & TOURISM

At Linville Falls *on the upper end of the gorge, the river plunges down a series of falls and chutes before it reaches this large pool. Silt from upstream development begun in the late 1960s continues to discolor the water, and may limit brown trout reproduction.*

That morning, the gorge looked wild and untamed. From my lofty vantage point, it appeared that no man had scarred this segment of the earth.

Linville Gorge Wilderness Area

A Visitor's Guide

For hikers, 22 miles of developed and primitive hiking trails provide access into the gorge and to all of the peaks which form the eastern perimeter: Sitting Bear, Hawksbill, Table Rock, the Chimneys and Shortoff Mountain. (The peaks of Table Rock and the Chimneys are outside the wilderness area boundaries.) Hunting and fishing are permitted in the wilderness area under the regulations set by the N.C. Wildlife Resources Commission.

A permit from the United States Forest Service is required for camping in Linville Gorge on weekends (Friday, Saturday and Sunday nights) and holidays from May 1 through October 31. Permits are issued from the District Ranger's office by mail or in person. Day use permits are not required.

Reservations are on a first come, first served basis. Group size is limited to 10. There is a time limit of three consecutive days and two nights placed on groups or individuals obtaining permits.

The Forest Service has developed an excellent topographic map of the gorge which shows all of the trails (no signs mark trails inside the wilderness area). A map and compass are essential. By mail, the map is $1.35 including postage and handling. It can be purchased at the District Office in Marion for $1.05. Maps and permits are available from: District Ranger, P.O. Box 519, Marion, NC 28752, 704/652-2144.

we had alerted friends about our hiking plans.

According to the Forest Service, at least one group gets lost in the Linville Gorge Wilderness Area each year. "They go in looking for well-marked trails which simply are not a part of the wilderness experience," states Alan Colwell, resource assistant with the Grandfather District. "The Linville Gorge presents the opportunity for challenge and risk. Visitors have an obligation and a responsibility to take care of themselves. They need to get a map of the area, use their compass and to know where they are at any moment."

That day we chose one of the more difficult and well-traveled paths into the gorge, the Conley Cove Trail. This area was named for the William Conley family who owned a large plantation nearby. The cove was the location of a small log house which they built as a hunting lodge. Rhododendron flowers formed a canopy over the trail; light glinted off the dew drops on each petal. It was a very impressive introduction. This trail would take us from our current elevation of almost 3,000 feet down to the river below, dropping 1,000 feet within 1.4 miles. Needless to say, we were all pleased that our trip would take us *down* this trail and return us to the ridge by a more moderate climb.

In choosing this trail, we had committed ourselves to visit one of the most overused areas of the gorge, a practice we usually try to avoid to minimize our impact on fragile areas. However, I needed to see the impact of such use firsthand. So we began our trip.

The trail descended steeply into the gorge, switchbacks angling back and forth among the spring flowers. A dense hardwood/pine forest rose above us. Despite the fact that we had many miles to hike during this day, we stopped often to enjoy such details as a huge hemlock tree or the way the morning sunlight illuminated the flowers. The wide range of moisture, topography and other physical factors along the walls of the gorge make it possible for a great variety of plant species to inhabit this area. Their communities range from the shrubs and lichens of the cliffs to the rhododendron and laurel understory along the river. Linville Gorge also shelters stretches of virgin forest and five rare and endangered plant species.

At last we heard the roar of the Linville River below us. Known to the Cherokee as Eeseeoh, this is "a river of many cliffs." Twelve miles of its banks pass through the steep walls of the gorge before breaking into the open levels of the Catawba Valley near Lake James. Along this journey, the river descends over 2,000 feet.

Reaching the river, we turned north on the Linville Gorge Trail. Looking up the steep eastern wall we could see Jonas Ridge

The trail descended steeply into the gorge, switchbacks angling back and forth among the spring flowers. A dense hardwood forest rose above us.

N.C. TRAVEL & TOURISM

***Trails in the** Linville Gorge are unmarked, though very well worn as a result of heavy traffic. Still, a map is a necessity. Most of the access trails into the gorge are also very steep, and hikers and campers should pack light. Permits are required, and there are other limitations.*

with its odd assortment of rock formations. Table Rock was an impressive sight as it towered over us.

After turning north, we had our first indication of what was to come. We immediately encountered eight backpackers carrying a "boom box" radio which could be heard even above the noise of the river. They said they were planning to hike up the Conley Cove Trail. Silently blessing their passing and wishing them good luck with their loads, we continued on.

As a backpacker, I had often heard stories from those who had unknowingly ventured into the gorge for some solitude and wilderness challenge during the summer peak-use season. During such trips, they had found anything but solitude.

I was reminded of these stories on this spring morning. The trash can at the river was full of beer bottles and other "essential" camping equipment discarded here at the base of the mountain rather than being carried back up by once-eager campers. Toilet paper flowers were everywhere along the trail. They barely covered the fecal matter which remained unburied on the surface. A short distance farther, we found an abandoned shelter. Young trees had been cut and clear plastic wrapped around them to form a crude hut abandoned some weeks before.

As I hiked the trail, I began to appreciate the challenge facing the Forest Service. The "land that nobody wanted" had turned into the land that everyone wanted to visit but nobody, except the Forest Service, wanted to take care of!

In order to distract myself from these troubling thoughts, I wondered why this area was called Linville Gorge. From the Forest

As I hiked the trail, I began to appreciate the challenge facing the Forest Service. The "land that nobody wanted" had turned into the land nobody wanted to take care of.

Service map I learned that both the gorge and the river were named for explorer William Linville. During 1766, the local Cherokee were at war with the settlers. Despite this, Linville, his son John, Chelsea Dobbs and John Williams were on a hunting and exploring expedition and they had camped for the night above what the Indians called the "Great Falls," which forms the northern boundary of the gorge.

According to Mrs. Emma L. Franklin in her unpublished work, *A Brief History of Linville Falls*, "the men were surprised by a group of Indians and both of the Linvilles were killed. Williams and Dobbs were injured but managed to escape to safety with their story. From this time on, the falls were called 'the Great Falls of Linville.' "

Today Linville Falls is not included in the designated wilderness area. Instead, it is a recreation area administered by the National Park Service. A variety of trails carry park visitors to the falls, offering one of the more scenic views in the gorge.

We discussed this history briefly as we continued along the trail. Almost 2 miles from where we had turned north, we stopped to enjoy the rest of the day and the evening under the magnificent layered rocks of Hawksbill Mountain.

Finding a level site for our camp was a challenge. We located ourselves at least 100 feet from the main trail in an area which seemed to receive limited use. We were almost out of water and refilled our bottles from the river. Since none of the water in the gorge meets state standards for drinking, we used five drops of iodine per quart of clear water to guard against giardia and any other contaminants.

Water quality in the Linville River is always a concern. The problem is pollution of the kind that you may or may not see. According to Colwell, the water has been contaminated by the septic tanks upstream and runoff from gas stations in the Newland area. In addition, tires and other trash float down the river during storms. Removing them from the gorge is a constant challenge. At times, as many as 300 or 400 tires may be piled up at the bottom of the trails waiting to be carried out.

The North Carolina Outward Bound School, whose Table Rock Base Camp is located just outside the eastern boundary of the wilderness, is one group that regularly volunteers for tasks of this nature. In cooperation with the Forest Service, they perform service projects which help keep the gorge in its wild state. In addition, they provide valuable search, rescue and fire-fighting assistance in this rugged landscape.

While resting on the river's boulders later that day, we looked up and noticed a bird soaring overhead. A quick check of the guidebook confirmed our hunches — a peregrine falcon. The N.C. Wildlife Resources Commission has restored several of these magnificent birds of prey to their former mountain homes through contributions obtained from the Nongame and Endangered Wildlife Program.

A variety of other interesting non-game species are also found in the gorge. These include songbirds, small mammals, salamanders and snakes. Along with the peregrines, several species of hawks and turkey vultures like to take advantage of the thermal currents near the cliffs. They can often be seen soaring overhead.

We didn't want to build a fire in this fragile area, so we used our backpacking stoves to prepare dinner. Later, we heard thunder rumbling up the gorge. High above Hawksbill, a flash of lightning split the sky. We were grateful for the careful planning and preparation we had made for this trip. That foresight gave us the opportunity to appreciate the storm from our warm, dry tents.

The next morning dawned clear and sunny. After returning our campsite to its natural state, we continued on our journey.

A little more than 3.5 miles from our first encounter with this river, we left its banks. Our map indicated a set of switchbacks that would lead us to the Babel Towers Trail, our destination. As we began the ascent we could see the spires of Babel Towers rising above the river.

Hiking this 1.4-mile trail allowed us to gain a modest 920 feet of elevation and return to our shuttle vehicle parked at the access area. Our hike had given us a better appreciation of the unique ecosystem of the gorge and of some of the problems facing the Forest Service. "The challenge in managing this area is a complex one," says Mike Anderson of the U.S. Forest Service. "We want to preserve the wild character of the gorge while providing the opportunity for solitude and challenge to its users."

During my journey, I had seen the best and the worst of what this wilderness has to offer. The worst, of course, had come from people's abuse. Thinking about this neglect, I remembered a passage from Aldo Leopold's *A Sand County Almanac*. "We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect."

The challenge of preserving and protecting this community must be accepted as a personal one by each visitor. In order to assure the future of this wild place, people must interact with the wilderness in a way that preserves and enhances its wild quality. And, everyone can help! For the experienced no-trace camper the challenge might be to choose to hike another, less used area of the national forest on a crowded weekend during the summer. Doing so will reduce the crowds in the gorge. For another visitor, the challenge might be to learn and practice no-trace camping. Or, it might be to leave the "boom box" at home and to learn to enjoy the music of the river instead. For the visitor to Wiseman's View, the challenge might be as simple as picking up a piece of trash left along the trail or in the parking area.

No matter what our current level of interaction with the wilderness, there is always another challenge we can face and meet in order to be responsible stewards.

Looking into Linville Gorge from Hawksbill Mountain, reflecting on the unspoiled beauty of this wilderness, I remember something else that Leopold noted. "Wilderness is a resource which can shrink but not grow," he wrote. It's a truth that today is peculiarly appropriate to "the land that nobody wanted." ⊠

Massive rock formations *jut out of the lush Appalachian forests at various points along the ridges and steep slopes in Linville Gorge. This rugged terrain also prevented wholesale logging at the turn of the century, and many huge trees remain.*

BARRY ROSEN

Volunteers Provide Labor, Materials

Trout Pond Built For Disabled Fishermen

Written and Edited by Mark Taylor

Being able to walk down a stream bank or wade a creek is something most fishermen take for granted. For the disabled, however, access to many waters is limited or virtually impossible.

Fortunately, disabled sportsmen in western North Carolina will have an easier time fishing in the future thanks to a joint project of several Trout Unlimited chapters and the U.S. Forest Service. Together, the groups built a trout fishing pond with access for the handicapped at the Forest Service's Mulberry Creek recreation area on the Pisgah National Forest in Caldwell County about 15 miles from Lenoir. All facilities, which include the parking lot, ramp and fishing pier, are wheelchair accessible.

"This was one of the most enjoyable projects I've ever worked on," said Dennie Burries, president of the Rocky River Chapter of Trout Unlimited in Charlotte. "We had about 20 members from our chapter, and there were also representatives from the Northwestern Chapter of TU in Hickory, Table Rock Chapter in Morganton, and the Land-of-Sky Chapter in Asheville. All were volunteers, and everyone really pitched in."

The fishing area was built using money from a federal Challenge Grant, which provides matching funds to projects using volunteer labor.

"The idea for building a fishing pond at Mulberry Creek has been kicking around for quite awhile," said Larry Neuhs, Forest Service wildlife biologist for the area. "Then we had the idea of building a fishing area for disabled sportsmen. Trout Unlimited quickly got behind it, and the Challenge grant was approved. We also had a lot of support from companies and government agencies. The Blue Ridge Electric Company of Lenoir provided materials and set the pilings for the pier, Duke Power Company donated some timbers, the Southern Bell Pioneers donated concrete, and Faw Construction Company of Lenoir provided machinery and manpower. Also, the Forest Service provided materials and expertise, the Soil Conservation Service helped design the pond, and the Wildlife Commission provided a bulldozer and operator to help clear it. This project was a real group effort."

The 1-acre pond was filled this spring, and stocked with trout by the Wildlife Commission. Although designed primarily for disabled anglers, it is open to everyone.

"There are no restrictions on who can fish in the pond, and we plan to hold some CATCH clinics there," said Neuhs. "However, we hope the public will consider the needs of disabled fishermen, and give them first priority."

C.G. HUGHES

Many Hands: *Volunteers from several chapters of Trout Unlimited helped build a fishing pier and pond for disabled anglers on the Pisgah National Forest. The project was a joint effort of the U.S. Forest Service and Trout Unlimited.*

Skyscrapers Hazardous To Health

Big Apple No Place For Timberdoodles

Dear *Wildlife:*

I am a former resident of North Carolina, transplanted to Manhattan 10 years ago. I have continued my subscription to your magazine since moving here, and read it with great pleasure.

Your December article on the woodcock cleared up a mystery for me, and I thought I'd pass the story on to you. I was walking down South Street, lower Manhattan, along the East River, when I spotted a large (for New York City, that's for sure) gamebird lying on the sidewalk. It was dead, and perfectly preserved, on its belly, looking like it was astride a nest. A most unusual sight in New York.

It was a woodcock, it turns out, as I learned from your article. I've spent a good deal of time in the forests of the Piedmont, and have never seen one of these gorgeous birds. My guess is that while migrating south, the woodcock collided with an office tower. The reflective glass so favored in Manhattan's new office buildings kills a lot of birds by reflecting the sky, and the birds can't tell the difference. Thus, this woodcock wound up on the sidewalk at the foot of an insurance building in lower Manhattan.

— John Foley
New York, NY

Fishing Best Below Dams

Channel Catfish Offer Anglers An Alternative

Summer rains often leave Piedmont rivers muddy for weeks. Most anglers don't like to fish turbid waters because many gamefish don't bite as well. But channel cats don't mind the mud, and they offer anglers a good alternative since they feed by smell.

"Channel catfish use their barbels to help them find food," said Cape Carnes, Piedmont supervisor for the Wildlife Commission's Division of Boating and Inland Fisheries. "In fact, muddy water is an asset because these catfish often seek cover when the water is clear."

Channel cats are native throughout the state, and are especially abundant in major rivers, streams and lakes of the Piedmont and Coastal Plain. Channel cats average 2 to 3 pounds, but often reach 15 pounds, and the world record is 58 pounds. Although they can be found in any deep hole or pool, one of the best places to fish for them is below a large dam.

"Shad and other forage fish are often stunned or shredded when they pass through turbines used for generating hydroelectric power, and the catfish are down below sitting at the dinner table," said Carnes. "Large holes below dams are excellent spots to fish. Of course, anglers should also be careful when fishing near dams — especially from boats."

Most catfishermen use "stink baits," which include such concoctions as beef or chicken livers, chicken guts, beef hearts, shrimp, cut mullet, cheese or doughballs. Live minnows and nightcrawlers are also effective. The bait should be fished on or near the bottom on stout tackle. Fishing is generally best at night because the fish are more active, although they are also taken throughout the day.

Many small city lakes, such as Rocky Mount City Lake, Quaker Creek and Oak Hollow lakes, Tar River Reservoir, and lakes Townsend and Higgins, are also good channel cat spots.

Members of the catfish clan suffer a poor image because of their preference for odiferous baits and turbid waters. The reputation is undeserved because most catfish don't eat garbage, but prey on smaller fish. And although they can survive in cloudy water, channel cats especially like clean, unpolluted waters. Finally, with catfish, beauty is certainly only skin deep.

"There's no finer eating fish in fresh water," Carnes states emphatically, "than a channel cat."

Fish Dish

Tarragon Filets Easy, Delicious

June is an excellent time to fish, and perhaps the only thing as enjoyable as fishing is eating the catch. This recipe for fish filets with tarragon is contributed by Jim Dean, editor of this magazine. Both fresh and salt-water fish can be used.

Fish Filets With Tarragon

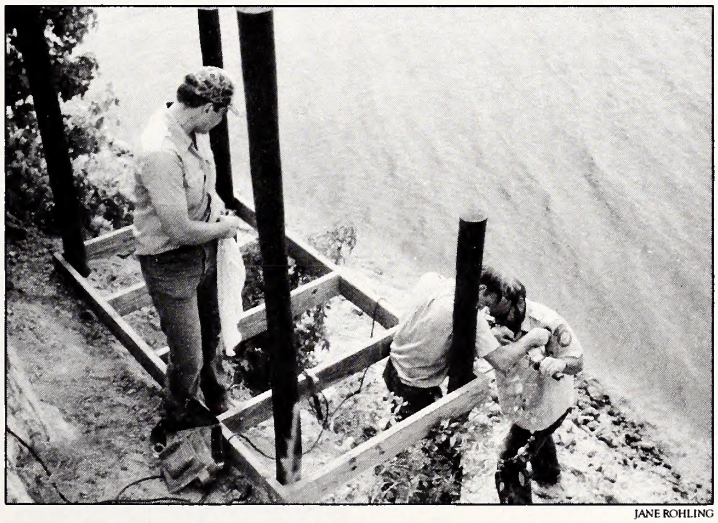
4-6 filets (flounder, sea trout, striper, largemouth bass or any non-oily white-fleshed fish)
4 Tbs. butter
1-2 cloves garlic, finely chopped
4-6 green onions, finely chopped
2-3 sprigs fresh parsley, finely chopped (or dried chopped parsley)
1 Tbs. tarragon leaves, fresh chopped (or dried chopped tarragon)
salt & pepper to taste
juice of 1 lemon

In skillet, melt butter and add garlic, onion, parsley and tarragon. Simmer lightly 1-2 minutes, but do not brown. Season fish with salt and pepper, then saute gently in butter mixture 2-4 minutes on each side depending upon thickness. Do not overcook or fish may be dry.

Place fish on warm serving dish. Remove skillet with butter mixture from stove and allow to cool for 1 minute, then add lemon juice and reheat briefly (do not boil) and pour over fish. Extra tarragon or garlic can be added to taste, and actual amounts of ingredients are not critical.

Paid For By New Excise Tax

Platforms Built For Bank Fishing



JANE ROHLING

Places To Fish: *Wildlife Commission fisheries development crews have been busy building fishing platforms for bank fishermen. Here, this crew of Keith Henderson, Glenn Kimbrell, and Bill Johnstone (left to right) work on one of 10 fishing platforms planned for Falls of the Neuse Reservoir. Fishing platforms are also planned for Jordan Lake, and on Badin Lake crews have cleared some of the shoreline and built fish attractors to improve bank fishing.*

This work is supported by the Wallop-Breaux expansion of the Dingell-Johnson Fund, an excise tax on fishing tackle and some boating equipment.

Heart Attack Victim Saved

Bear Facts Help Pass Time On Long Ride

What would you do if you were miles from nowhere, and someone drove up and said "I think I'm having a heart attack?" David Allen, a Wildlife Commission wildlife management crew leader from Andrews, experienced just such an encounter on a beautiful Indian summer day last October.

"I was talking to some bear hunters in a remote section of Cherokee County when a car pulled up in a cloud of dust," Allen recalled. "An elderly man got out and said he thought he was having either a stroke or heart attack. He was holding his chest with one hand and his throat with the other. He asked me to drive him to the hospital."

As they got into Allen's truck, the man said he had a history of heart attacks and had already taken his nitroglycerin tablets.

"Don't worry," Allen said. "I'll get you there."

As they drove, the man kept clutching his throat. Allen learned that he was an old bear hunter, and tried to get his mind off his condition by talking to him about bear hunting.

"We talked about bear hunting for a bit," said Allen, "but he wanted to talk about a cousin of his who had died of a massive heart attack shortly before."

Allen assured him that everything would be fine, but asked if he could drive a little faster than the traffic. The man nodded, and Allen began passing cars, blinking his lights, and blowing his horn as he sped down the narrow, winding road. "All I could do was keep talking and pray we'd make it in time," said Allen. "It's strange what goes through your mind at a time like this, but it makes you stop and think about what's really important in life."

Good fortune was with them, however, and they made it to the hospital in time. Allen was glad to hear later that the man recovered fully, but it's not a ride either of them would be in any hurry to repeat.

— Jay Davies

Contact OWAA

Need Speaker For Meeting?

If you're looking for a program for your sportsman or civic club, the Outdoor Writers Association of America (OWAA) may be able to help. The OWAA maintains a speaker's bureau, and has approximately 300 speakers available. Topics include hunting, fishing, conservation, wildlife photography, and other outdoor activities.

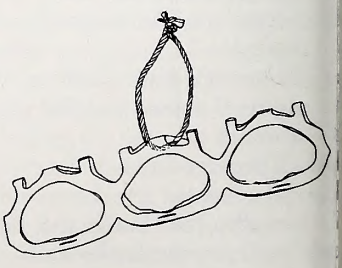
The 1988 OWAA speakers listing is available by writing the Outdoor Writers Association of America, 2017 Cato Avenue, Suite 101, State College, Pa. 16801.

Good Tip

Rod Holder Aids Surf Fishermen

Carrying an armful of surf-fishing equipment down to the beach is no easy task. Nicholas Serge of Morehead City offers this tip to fellow surf fishermen for carrying rods and some types of sand spikes.

"I take the plastic rings from a six-pack of drinks, bend them in half lengthwise, and staple them together," he wrote. "A small loop of string fastened in the center connects the plastic rings to your belt, and you can slip the rod butts and spikes into the rings, making them much easier to carry."



Bottomland Print Offered

Proceeds from the sale of these prints will be placed in the Nongame and Endangered Wildlife Fund which supports a variety of nongame wildlife projects and the purchase of wildlife habitat in North Carolina. Each poster-sized, numbered print bears the North Carolina State seal, Governor Martin's signature, and the artist's signature.

Please send me ____ 1987 Nongame and Endangered Wildlife Prints @ $25.00 each $_____

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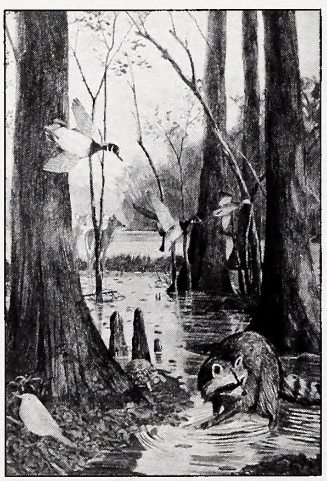

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All orders must be prepaid. We do not bill. A $15.00 charge will be made on returned checks (N.C.G.S. 25-3-512). PLEASE ALLOW 8 WEEKS FOR DELIVERY.

Lists 84 Locations

Guide Is Great For Field Trips

Field trips play an important role in most teachers' classroom work. Now there is a guide to parks, museums and science centers that is sure to help teachers plan their activities.

Published by the North Carolina Academy of Science, *Guide to North Carolina Science Centers* summarizes the services provided by 84 private, state and federal education centers, and gives their locations and schedules as well. Especially helpful is a section on state parks showing their locations and listing their addresses.

Single copies of the guide cost $5, including tax, plus $1.05 for mailing. To order copies write: The North Carolina Academy of Science, Inc., c/o The North Carolina School of Science and Mathematics, P.O. Box 2418, Durham, NC 27705.

Calendar Of Events

June 18
North Carolina Blue Crab Derby in Morehead City. Features crab races and cooked crab.

June 18-19
31st annual Carolina Sailing Club Governor's Cup Regatta at Henderson Point on Kerr Lake.

June 18-19
20th annual Tar Heel Regatta at Lake Wheeler in Raleigh. Largest power boat race in the eastern United States.

June 1-30
Zoo and Aquarium Month at the North Carolina Zoological Park in Asheboro. For more information contact the N.C. Zoo, Rt. 4, Box 83, Asheboro, N.C. 27203.

June 11
Latta Park Folk Festival at the Latta Plantation park in Charlotte. Features traditional and folk music, dancing, and crafts.

June 18
Annual meeting of the N.C. Coastal Federation at the Duke University Marine Laboratory in Beaufort. Sessions will focus on how rising sea levels will affect our coast. Also, two benefit performances (June 17, 18) of *King Mackerel And The Blues Are Running*, Bland Simpson's popular musical about the North Carolina coast, will be held at the West Carteret High School in Morehead City.

Information on the meeting and play are available from the N.C. Coastal Federation, 1832 E. Bell Lane, Newport, N.C. 28570.

Memories Jogged
Reader Built Cataloochee Mill

Dear *Wildlife:*
I just wanted to tell you what a surprise our family had when we opened the November issue of *Wildlife In North Carolina* and saw the article on old mills. My 93-year-old grandfather was thrilled to see the picture of the Cataloochee Mill. His great grandfather built that mill, and the article brought back a lot of memories.

My grandfather built another mill 40 years later on Davis Branch, which was just downstream from the mill pictured on Pretty Hollow Creek in Cataloochee. I enjoyed learning how the two mills worked. He said the older mill always "froze up" in the winter, but he built his using different methods. Both mills operated on Wednesdays and Saturdays, and charged as a toll one-eighth of the grain ground.

— *Mary Welch*
Greensboro

Repairing Broken Fishing Gear

Tackle Care by C. Boyd Pfeiffer. Published by Nick Lyons Books, 31 West 21 St., New York, New York 10010. $9.95. 148 pp., softcover.

Most fishermen could fill a closet with broken fishing tackle — rods with missing tips, spinning reels with worn out bail springs, and the like. Often, these items need only minor repairs. *Tackle Care* explains how to make such repairs on all types of fishing tackle, and outlines preventative maintenance which will keep your tackle in good shape. Sources of additional information and materials are also included. Any angler who likes working on tackle, or is interested in saving a few dollars, would enjoy this book.

Acid Rain May Kill Waterfowl

Acid rain may play a role in the destruction of waterfowl populations. That's the conclusion of a report entitled *Acid Rain and Waterfowl: The Case for Concern in North America* recently issued by the Izaak Walton League.

The report notes that research on severely acidified lakes in Canada, Scandanavia, and the Adirondack Mountains of New York show that these waters no longer harbor the plant and aquatic invertebrate life needed to support healthy waterfowl populations.

The paper also notes that this may especially be a problem for black ducks, which have declined by 60 percent in the last 30 years.

Black ducks breed in northern New England and eastern Canada, and studies in Quebec shows that heavily acidified lakes and marshes will no longer produce adequate food to meet the newly hatched black duck's nutritional needs.

The Wildlife Endowment Fund Report

The Wildlife Endowment Fund is supported by the sale of lifetime licenses, lifetime subscriptions to *Wildlife in North Carolina*, and tax-deductible contributions. Only the annual interest from this fund is used for wildlife conservation, and the fund will play a key role in supporting wildlife programs in the future. Interest is earned through investments made by the State Treasurer's Office. For more information, write to the Wildlife Endowment Fund, N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27611.

Status on March 31, 1988

	Numbers Sold	Revenue Received
Lifetime Sportsman's License	44,329	$14,193,649.53
Lifetime Hunting License	311	74,224.93
Lifetime Fishing License	3,342	618,205.73
Lifetime Subscriptions to Wildlife in N.C.	1,308	167,043.46
Contributions	—	106,146.43
Fund Total		$15,159,270.08
Total Interest Earned	$2,738,448.31	

Old Ones Expire This Month

Don't Forget New Licenses

JIM DEAN

Be Prepared: *Summer is a great time to catch bass, but don't forget to buy a new license. Annual hunting and fishing licenses expire June 30, and may be purchased from license agents across the state. Applications for lifetime licenses are also available from license agents.*

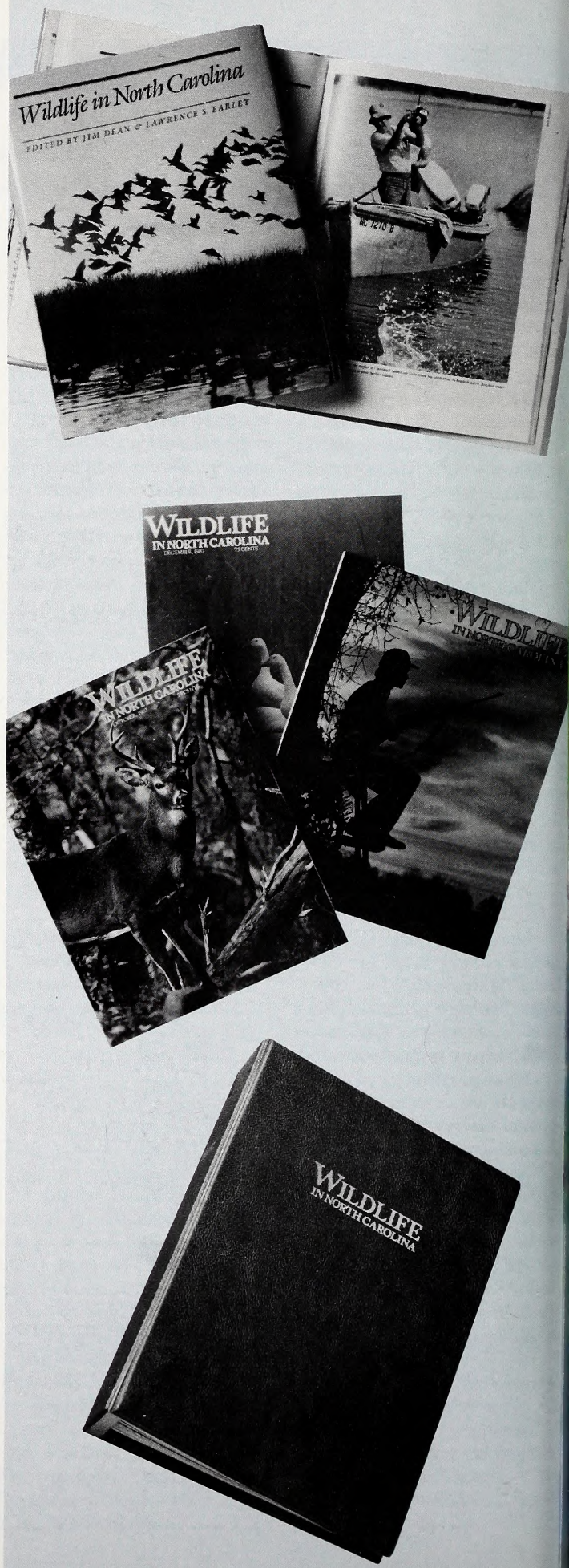
Everyone's talking about *Wildlife in North Carolina*... the book!

"This attractive book is probably intended for the sports or outdoors person; but in fact it should appeal to anyone with an active interest in our state's history, natural or otherwise."
— Michael McFee, *The Spectator*

"This book . . . is a fitting commemoration of the magazine's 50th anniversary. The book's four sections reflect the emphases seen each month, as the magazine seeks to interest nature lovers and environmentalists as well as the serious hunters and fishermen . . . ."
— Linda Brinson, Winston-Salem *Journal*

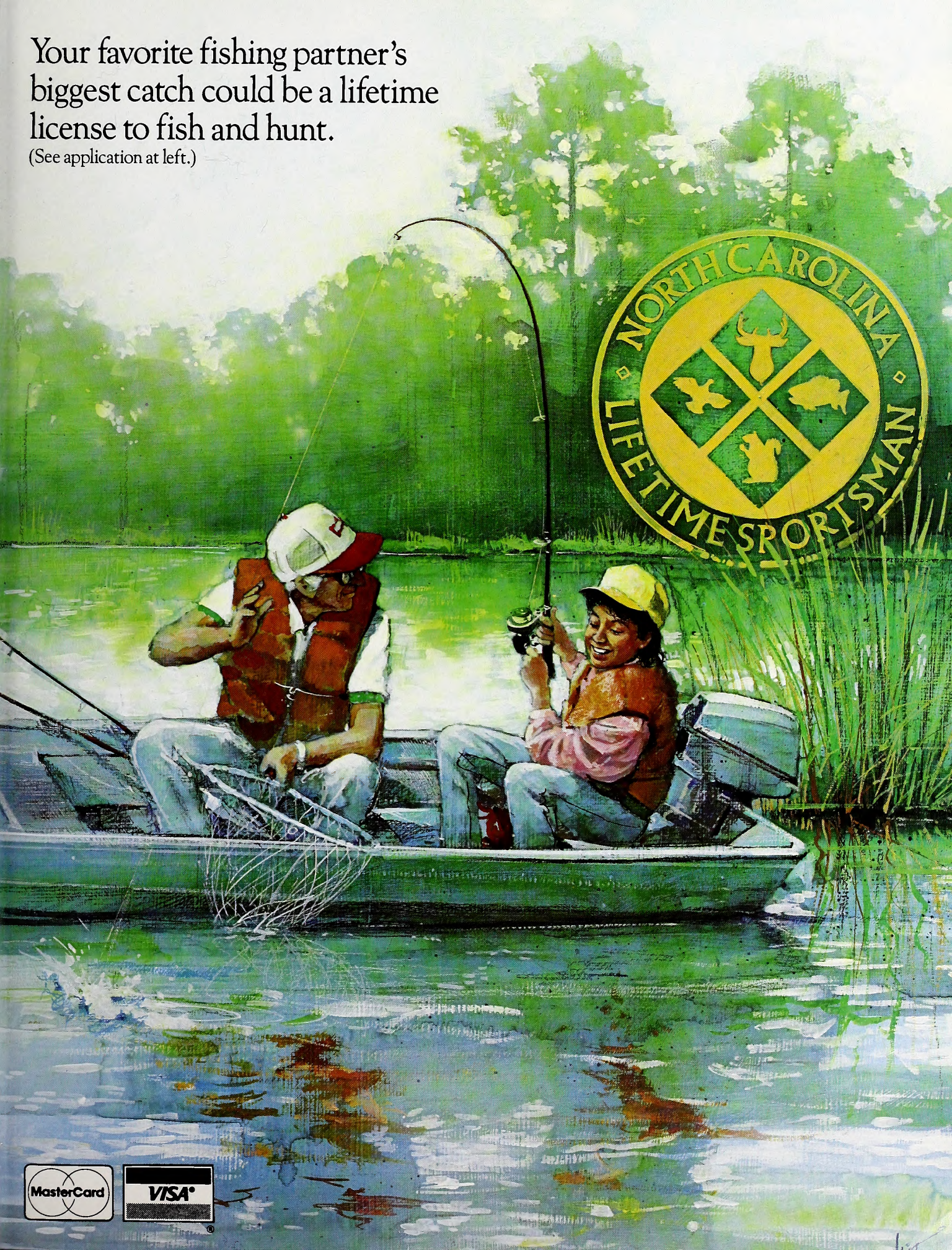
"It is not only for the sportsman in the family but for all the family and an excellent book to send both to Tar Heels who have moved away and to folks who have just moved into North Carolina . . . . The only fault I find with *Wildlife in North Carolina* is that it is not long enough."
— Buggs Barringer, Raleigh *News and Observer*

Published by the N.C. Wildlife Resources Commission and the University of North Carolina Press. Hardbound copy is $24.95 at your local bookstores.
Or order direct using the special order form on the opposite page.



Your favorite fishing partner's biggest catch could be a lifetime license to fish and hunt.

(See application at left.)



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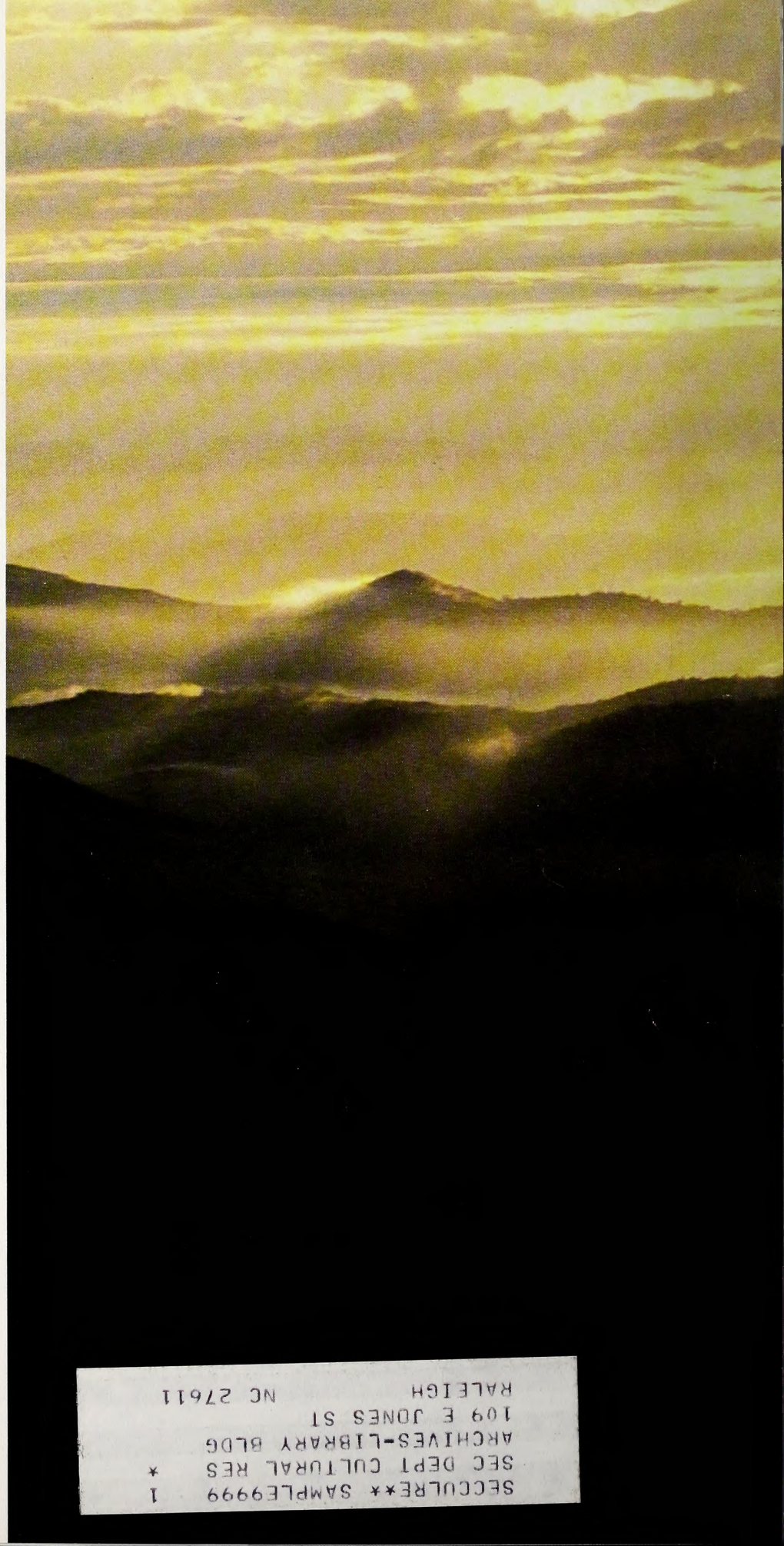

View From The Top

From the rim of Linville Gorge, shafts of early morning sunlight set the mountains glowing for as far as you can see.

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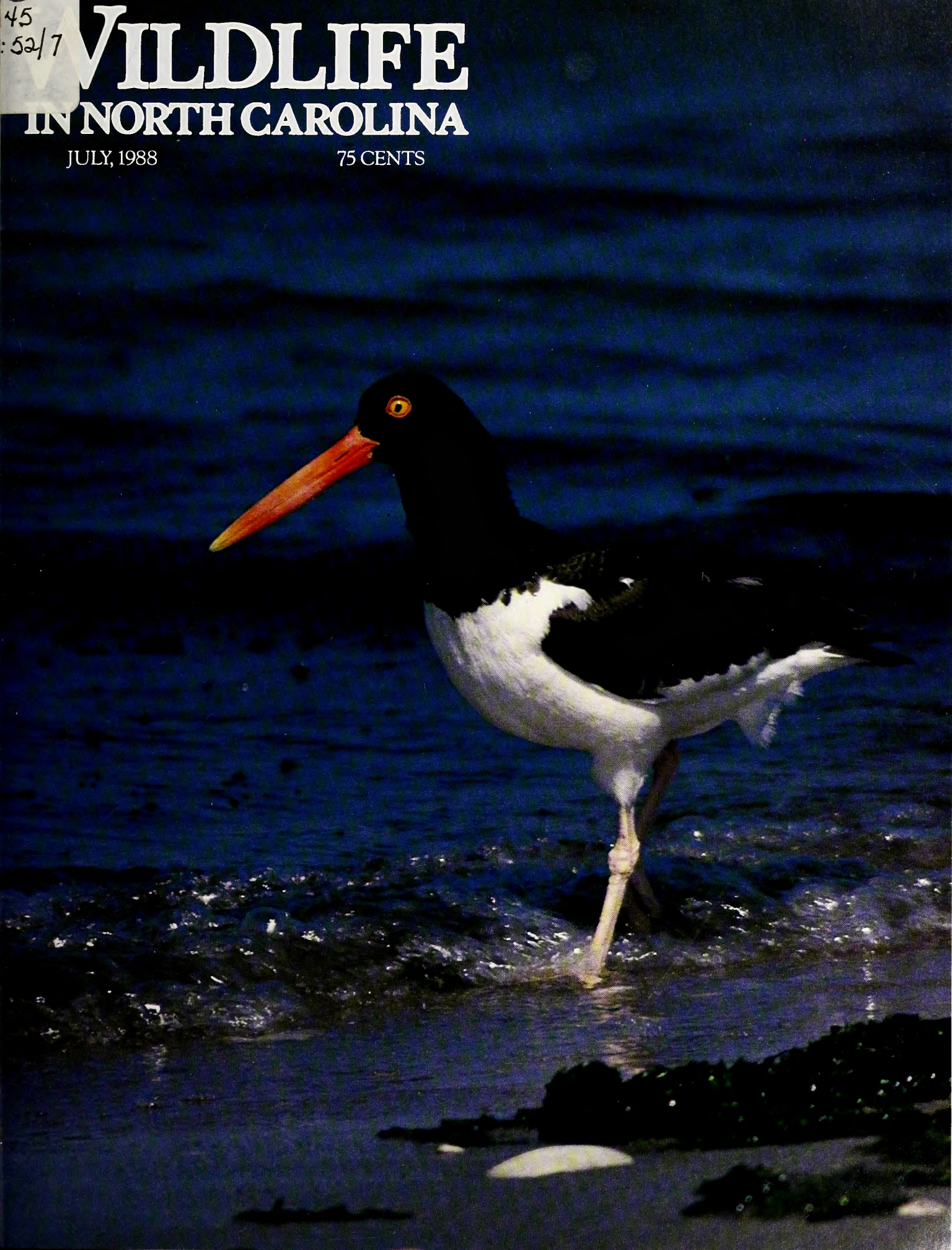
WILDLIFE IN NORTH CAROLINA

JULY, 1988 75 CENTS

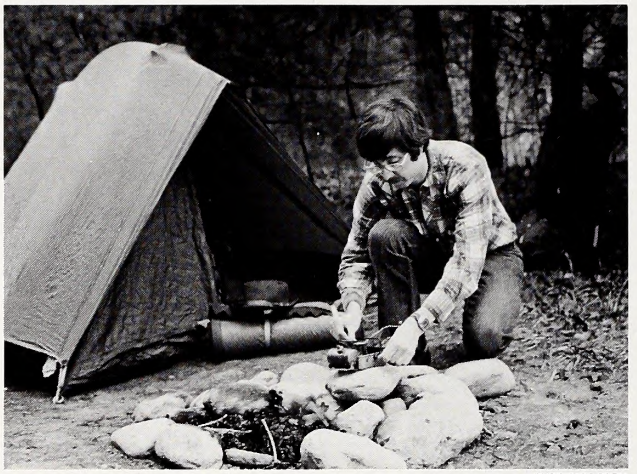


Kephart's Timeless Wilderness

by Jim Dean

Most of us can recall the first night we spent outdoors — vividly if not fondly. It may have been in the backyard under a play tent, a few sleepless hours interrupted fortuitously by a mother bearing peanut butter and jelly sandwiches. More likely, you took your first real camping trip as a Scout. And if you don't have happy memories of it, perhaps it's because you were the troop nerd — life was not simple for such poor souls.

Yet, somehow, the sense of freedom and self-sufficiency from a night under canvas taps deep roots. Like the love of an open fire or the urge to hunt or fish, camping draws out some of our earliest instincts.



CURTIS WOOTEN

It's a curious phenomenon that camping seems to be more popular than ever. Despite a shrinking wilderness, our growing population apparently has some primitive need to spend more and more time in it. The sale of modern camping gear is big business, and equipment is much improved.

Yet, when reading Horace Kephart's "Camping And Woodcraft," one is aware how little camping has actually changed. Portions of this 479-page, two-volume compilation were first published in 1906 and recently reprinted (The University of Tennessee Press; $22.95, hardback, and $10.95, paperback; forward by Jim Casada). Kephart spent years camping in what is now The Great Smoky Mountains National Park, and his practical writings on the subject became the bible for all campers.

Many of his observations and tips are still useful, and are offered with accurate humor. Consider what he has to say about camping companions. "Not every fellow in town makes a pleasant comrade in the woods . . . no one is fit for such life who cannot turn ordinary ill-luck into a joke, and bear downright calamity like a gentleman."

Kephart's insight is equally on target in this observation on the essentially solitary nature of any outdoor experience, and the qualities that make a good camper. "Chief of these is a love of Nature for her own sake — not the 'put on' kind that expresses itself in gushy sentimentalism, but that pure, intense, though ordinarily mute affection which finds pleasure in her companionship, and needs none other."

Unlike some of his fellow outdoor writers, Kephart lived the life he wrote about. "When you seek a guide in the mountains he looks first in your eyes and then at your shoes. If both are right, you are right." Good boots and grit; absolute necessities then and now.

Roughing it never has been more than a figure of speech among skilled outdoorsmen like Kephart. "When (suffering) is endured merely to show off one's fancied toughness and hardihood it is rank folly. Even the dumb beasts know better, and they are particular about making their beds." In the same vein, Kephart offered accurate advice when it came to weather. "Don't trust a fair sky."

Kephart was also something of a nutritionist, and urged campers to choose their foods carefully. He scorned those who relied solely upon pork, flour, baking powder, salt, sugar and coffee — using their guns and rods to furnish variety. "This sounds sturdy, but there is a deal of humbug in it." Instead, he suggested many practical alternatives, one that sounds downright trendy. "A tin of imported Camembert will be a pleasant surprise on some occasion."

A good ax was — still is — vital, but frequently misused. "An axe lying around camp has a fatal attraction for men who do not know how to use it . . . somebody will pick it up, make a few bungling whacks at a projecting root, or at a stick lying flat on the ground, drive the blade through into the earth and pebbles, and leave the edge nicked so that it will take an hour's hard work to put it in decent order again. And the fellow who does this is the one who could not sharpen an axe to save his life." Kephart also had no use for large, impractical knives. "Such a knife is shaped expressly for stabbing, which is about the very last thing that a woodsman ever has the occasion to do . . ."

There are countless practical tips in this venerable volume — among them some we might find nowhere else. "If you catch a flea," advises Kephart, "don't try to crush it, for you can't, but roll it between your fingers; that breaks its legs . . ."

While Kephart's knowledge of woodcraft was impressive, he was not too proud to point out mistakes he'd made enroute to greater understanding. "Once when I got lost in the big woods I was not frightened, and yet I did a perfectly idiotic thing: to hold my compass level and steady I set it on the thick muzzle of my rifle barrel! That made the needle swing away out of true. It was ten minutes before I thought of this, and tried again, with all iron carefully put aside. That shows what a dunderhead a fellow can be, even when he is fairly cool."

Kephart, of course, didn't have the advantages of superb high-tech gear, but you can bet he would have quickly learned which items were vital and which were not. And though his book has been around eight decades, it's still valuable reading, especially by firelight.

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WILDLIFE IN NORTH CAROLINA

Wildlife in North Carolina is the official educational publication of the North Carolina Wildlife Resources Commission, and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources and the environment we share with them.

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Cover *A pair of oyster catchers prowls the shoreline at Hammocks Beach, one of many interesting shorebirds found here occasionally. Photograph by Ken Taylor.*

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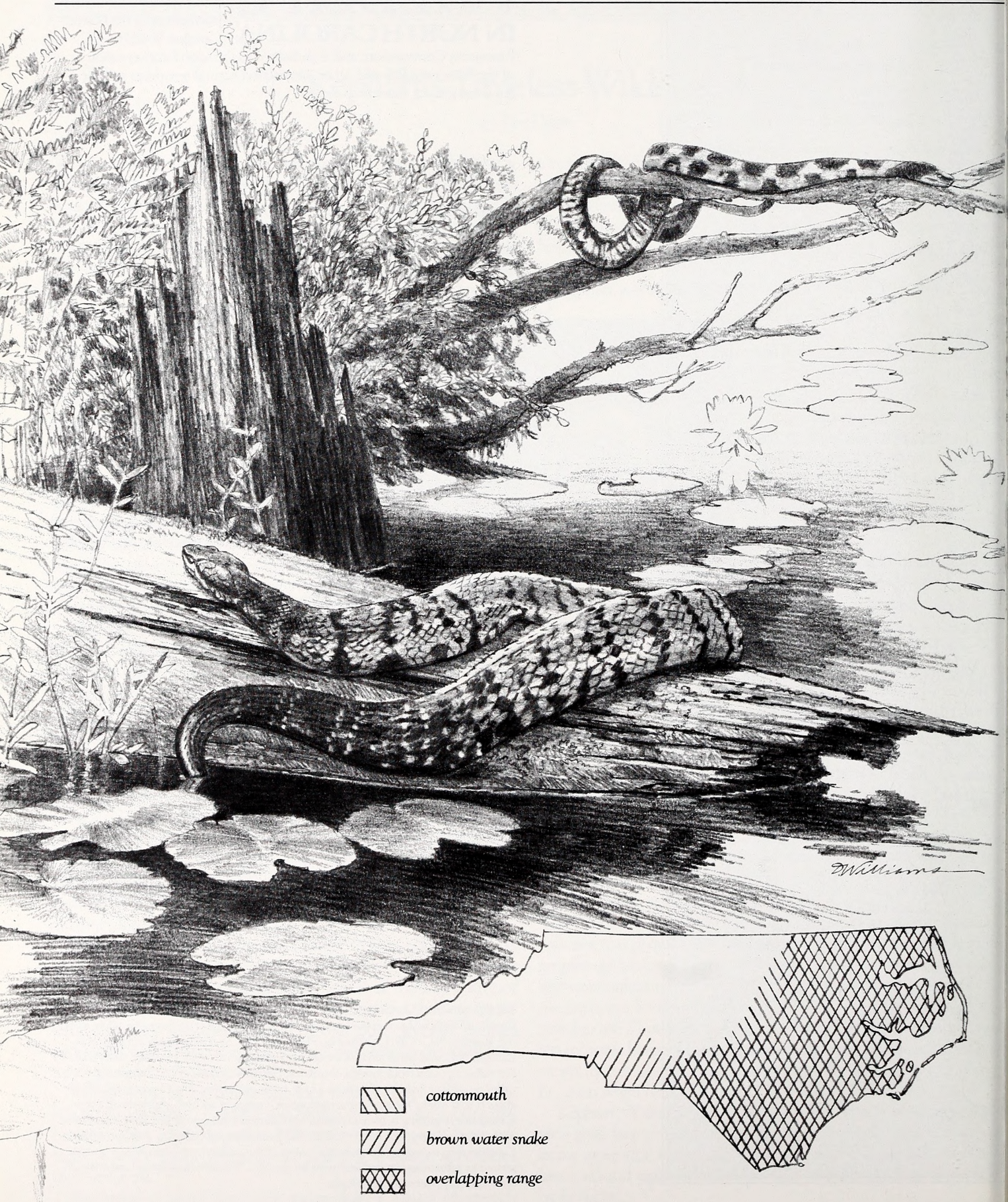
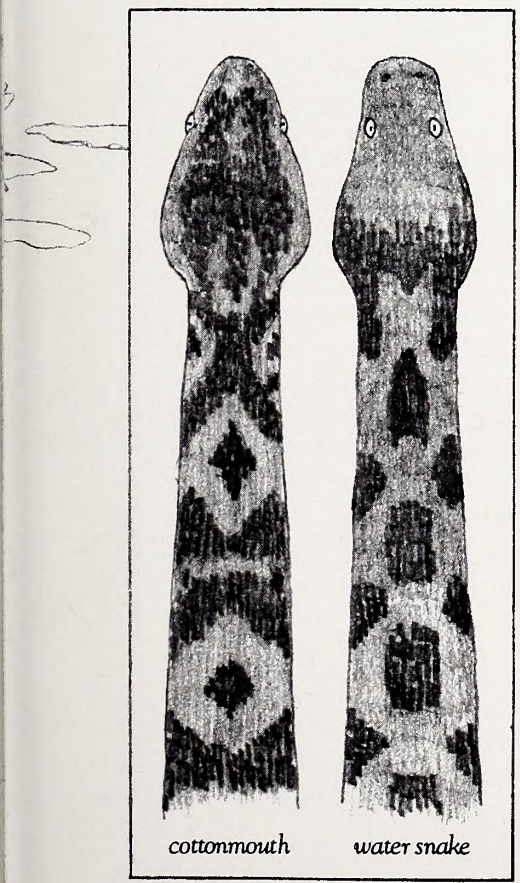

cottonmouth
brown water snake
overlapping range

Snake In The Boat!

written by Lawrence S. Earley / illustrated by David Williams

***Swamps and creek** bottoms throughout the eastern part of the state are prime habitats for water snakes and cottonmouths (water moccasins). Cottonmouths prefer sunning on old logs while water snakes are often seen higher up, coiled along overhanging branches. When startled, they fall into the water. When threatened, cottonmouths open their mouths to show a white interior.*



***Water snakes and cottonmouths** have different body patterns. Cottonmouths tend to have distinct dark bands across their bodies, while brown water snakes have alternating dark blotches.*

All right, let's see what you know. You're poling your boat through some low water on an eastern stream. You duck under a low-hanging branch. Suddenly you hear a rustling of leaves and then a brownish mass of reptilian coils drops into your boat.

Quick! Name that snake.

You know, of course, that it's likely to be one of two lookalikes that inhabit these sluggish, swampy waters. One is the cottonmouth or water moccasin *(Agkistrodon piscivorus piscivorus)*, a poisonous snake of fearsome reputation. Its venom ranks third in toxicity after that of the coral snake and the eastern diamondback rattlesnake. The snake could also be a nonvenomous water snake, probably the brown water snake *(Nerodia taxispilota)*. All of these snakes are wide-bodied, with lengths of up to 5 feet, widths of 3 inches, and similar coloration (brown, olive, black). But which one is now writhing at the bottom of your boat?

We all know the rules of thumb, although how handy they are going to be in this situation is a matter of dispute. A cottonmouth possesses heat-sensing pits — more like slits — between the nostrils and the eyes. It has fangs, elliptical pupils and a single row of scales beneath the tail. The brown water snake has no pits or fangs, its pupils are round and underneath its tail is a double row of scales.

You'll be pardoned if you don't bend down to get a closer look at your snake's pupils. Time is of the essence here.

What may help you decide whether to jump overboard or not are some more obvious field characteristics — physical and behavioral — that can be noted even when you're terrified. Alvin Braswell, curator of lower vertebrates at the N.C. Museum of Natural Sciences can give you guidance in this matter. Pay heed to his tips:

- Though similar, the body markings of both snakes are different. The cottonmouth has distinct dark bands across its brown body while the brown water snake has dark, alternating splotches.
- If the reptile is coiled around a tree limb 10 or 15 feet high, it's probably a water snake. These snakes climb higher than cottonmouths. Cottonmouths like to bask on logs and don't climb very high.
- Some water snakes are quick to spook and will normally be gone before a boat approaches their basking location. A brown water snake is less quickly spooked and may decide to bail out only when your boat is passing beneath. A cottonmouth will take to the water as well, but as the herpetologists like to say, it's more dignified, preferring a slow retreat. It may even stand its ground, opening its mouth to reveal a white lining.
- The water snake will dive to escape a threat and stay under longer. The cottonmouth will also dive, but surfaces more quickly.
- A cottonmouth swims with a good bit of its body above the water, like a floating inner tube. Some show a water stain from their midline up, indicating just how high they ride. A brown water snake generally swims lower, with just its head and a little bit of its back above the water.

You may have decided that the snake is most likely the nonpoisonous water snake, but you might consider jumping overboard anyway. The brown water snake is very aggressive and will bite repeatedly when cornered. It may decide it wants your boat for a while. You may decide to give it to him.

"Do-Nothing" Largemouths

When bass are hanging around instead of biting, one of these simple tricks may wake 'em up.

written and photographed by Pete Elkins

"Doing nothing" for summertime bass may conjure images of lazing in the sun while some magic bait or lure searches out fish. Alas, as with most aspects of bass fishing these days, it's not quite that simple.

"Do nothing" bass tactics actually refer to two very different angling techniques; one relatively new and the other a veteran of sorts.

The veteran "do nothing" tactic evolved in Tennessee's system of fertile Tennessee Valley Authority lakes for both smallmouth and largemouth bass. As popularized by avid angler Charlie Brewer, the method is designed to catch average-sized bass with light spinning tackle in clear water.

Though effective throughout the year, it is particularly applicable during the summer months on North Carolina's lakes when they're crowded with recreational boaters, and any bass is tough to catch. It's also a technique that's easy and lots of fun because it usually creates fast action.

Reduced to essentials, the tactic involves a steady, actionless retrieve using a short 4-inch plastic worm impaled on a flattened jig head. Under average conditions, 6-pound monofilament is a good choice, and usually adequate for the smaller bass you're most likely to catch. In really clear water — not uncommon in Carolina lakes during the summer — 4-pound line may sometimes be a better choice.

There are really two conditions perfectly suited for Brewer's do-nothing style — when bass are suspended, and when they're hanging around docks.

Largemouth bass, as well as smallmouth and spotted bass, often "suspend," or position themselves somewhere between the bottom and surface. These suspended bass are responsible for many of those "you should have been here yesterday" excuses.

At Kerr Scott Lake near Wilkesboro, for example, spotted bass seem to be especially fond of hanging out in mid-depths throughout the year, and that makes them hard to find and catch. But this habit is by no means restricted to spotted bass.

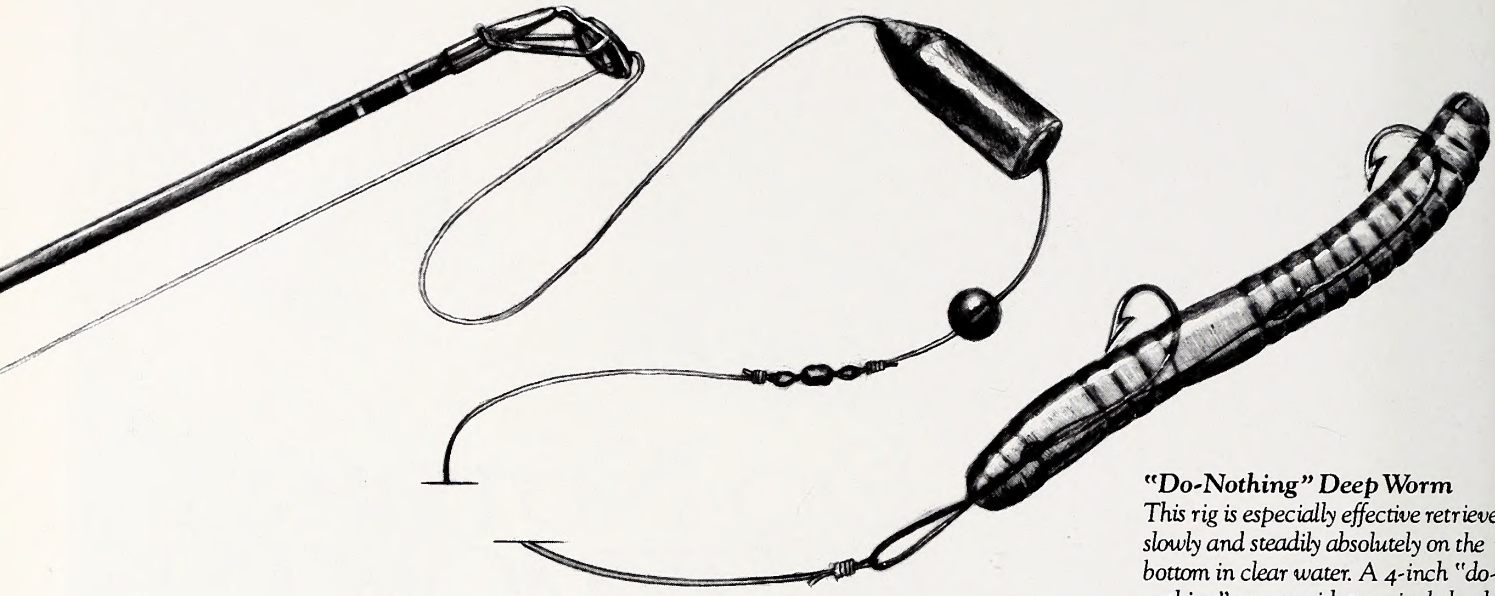
Obviously, the first step to catching suspended bass is to determine the level at which they are suspended. Depthfinders simplify the task, but if bass are suspended near the surface — less than 15- to 20-feet deep — the odds are increased that you'll alert the fish when you pass over them in your boat.

If you use a depthfinder, it's a good idea to "mark" several spots that you think may hold suspended bass, then quietly return to the first area marked, and fish it from a distance by making long casts.

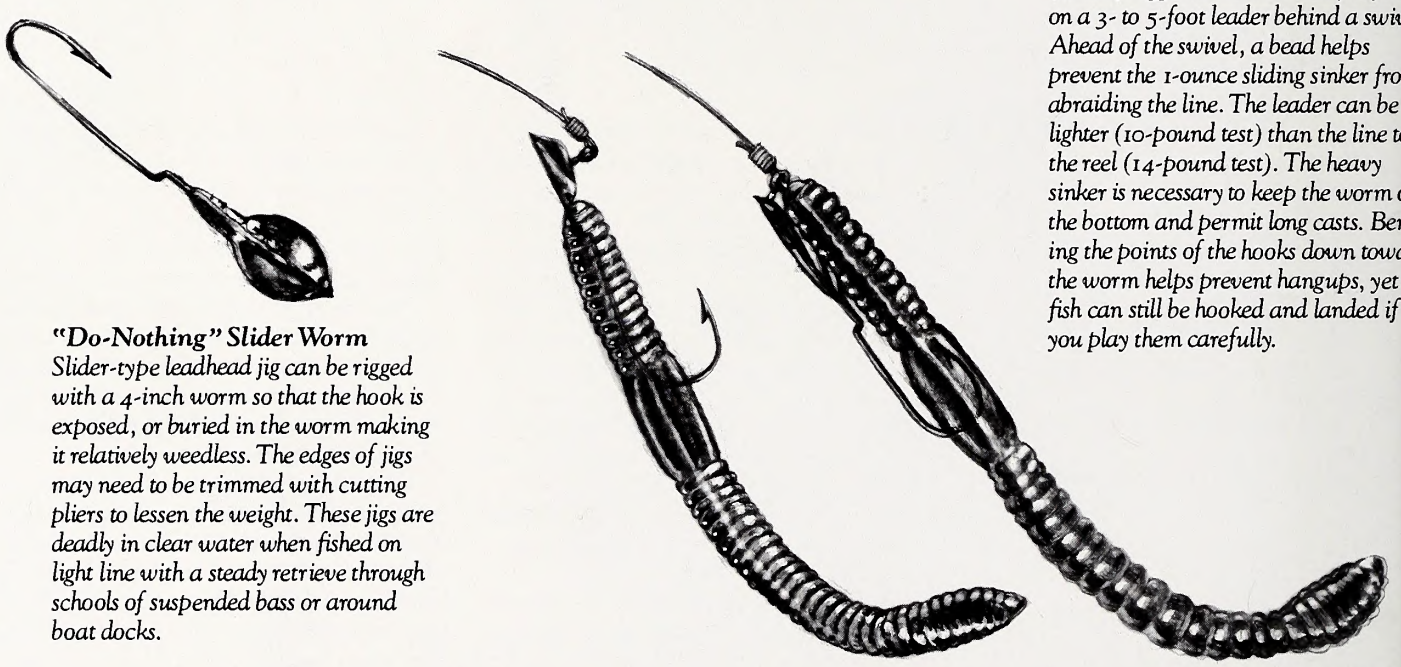
With light tackle and line, long casts are easy with do-nothing worms on jig heads weighing ¼ ounce. The lure must be heavy enough for long casts, yet light enough to "swim" almost buoyantly through suspended bass schools.

In practice, it often works like this. If you know a point holds a school of suspended bass, approach to within range of a long 70- to 80-foot cast. Then, cast beyond the point, beginning a silent "one-thousand-one, one-thousand-two, . . ." count as the jig and worm sinks. Watch the spot where the line enters

***Small slider "do-nothing" worms** on jigs will catch bass in clear lakes in the summer months when many other tactics fail. Used properly, they're especially deadly on bass that are suspended at mid-depths.*



"Do-Nothing" Deep Worm
This rig is especially effective retrieved slowly and steadily absolutely on the bottom in clear water. A 4-inch "do-nothing" worm with two single hooks (usually rigged on stout thread) is fished on a 3- to 5-foot leader behind a swivel. Ahead of the swivel, a bead helps prevent the 1-ounce sliding sinker from abraiding the line. The leader can be lighter (10-pound test) than the line to the reel (14-pound test). The heavy sinker is necessary to keep the worm on the bottom and permit long casts. Bending the points of the hooks down toward the worm helps prevent hangups, yet fish can still be hooked and landed if you play them carefully.



"Do-Nothing" Slider Worm
Slider-type leadhead jig can be rigged with a 4-inch worm so that the hook is exposed, or buried in the worm making it relatively weedless. The edges of jigs may need to be trimmed with cutting pliers to lessen the weight. These jigs are deadly in clear water when fished on light line with a steady retrieve through schools of suspended bass or around boat docks.

ILLUSTRATION BY GINNY RAYNOR BROWN

the water, and begin the retrieve at the count of 10. Begin the retrieve by slowly raising the rod tip from 9 to 12 o'clock. When the rod reaches the top of the slow lift, reel slowly as you drop the rod tip back to the 9 o'clock position. Ten feet below the surface, the jig and worm will move slowly and steadily forward while remaining at the same 10-foot depth.

Make a half-dozen casts, then add two counts so that the next six casts are approximately 2 feet deeper. Keep fishing deeper and deeper until you feel a strike signaled by a sudden weight. There's no need to set the hook hard. Simply lift the rod smoothly, but firmly in a high sweeping motion while reeling rapidly. I've used this tactic successfully many times, and quite a few professional tournament anglers quietly reach for slider worms and do-nothing tactics when suspended bass are coy.

Dock-dwelling bass are also perfect targets for light tackle "do-nothing" methods, and many Tar Heel reservoirs are rimmed with man-made cover like docks, boathouses, piers, and similar structures. Fishing such cover combines light tackle, do-nothing tactics with the basic appeal of casting to shoreline targets.

I like to start off with 6-pound mono around docks for the simple reason that some bass will invariably duck around an entanglement before you can steer them into safer water. Use lighter line only if you must. As with suspended bass, long casts may be required for spooky bass, but you can usually get relatively close to dock bass. Worms on slider jigs may be rigged both weedless or with an exposed hook, and weedless rigging is almost a necessity when fishing docks. The most productive boat docks and piers are those sweetened with planted brush by crappie-conscious property owners. Bass like the same brushpiles. The best retrieve is the slow and steady so that the lure barely ticks the top of the cover or brushes the side of the pilings.

If your favorite lake features clear water and a lot of docks with lights, plan on losing some sleep for some excellent night bass fishing. Many lures and methods will pro-

duce nocturnal bass, but nothing will match a slider jig and worm gliding just beyond the glow of a docklight swarming with mayflies and other night bugs. Use 6-pound line with a black or purple worm, and be as quiet as possible.

There's another "do-nothing" method, a method much cruder, but much easier to master, and no less effective for bottom dwelling bass at depths from 5 feet to 45 feet deep.

Any serious bass angler already has the basic tackle for this method — a stiff, 5- to 6-foot casting rod with a free-spool casting reel and 12- to 20-pound mono. Spinning tackle will also work, and I've customized a very stiff 7-foot graphite blank into an outfit for this bottom dredging method.

You'll need a slip sinker that weighs 1 ounce! I know that sounds too big, but it is necessary. After slipping the sinker on the line, slide a large red or chartreuse plastic bead below the sinker, and then tie a swivel to the end of the line. The rig is completed by attaching a 3- to 5-foot leader to the swivel, and knotting a short "do-nothing" worm with two hooks to the business end of the leader. The leader should be lighter mono than the main line. For example, I like to use 14-pound mono on the reel and 10-pound mono between the swivel and worm. If you get hung on the bottom, you'll lose only the worm rather than the entire rig. The lighter leader may also be less visible to bass in clear water.

It may also be a good idea to carefully bend or "roll" the hook points down until they almost touch the body of the worm. This modification significantly reduces hangups in thick bottom cover, but you'll find you don't lose too many fish. The big sinker permits long casts and sinks quickly, while the plastic bead serves to protect the knot from constant abrasion with the big sinker.

When this method first gained national attention several years ago, there were only a few specialized worms available. Now they abound in endless colors and variations. The original style is still my favorite — a simple 4-inch skinny worm with a small hook fore and aft secured with internal dacron or nylon thread which is looped at the head of the worm for a line tie. In fact, the basic worm used in the original rigs was the "Fishfinder" worm made in Gastonia, and it's still a favorite.

Best results occur when long casts are made to points, underwater islands or humps, and creek ledges, and it's a perfect summertime method when the bass aren't on shorelines. One consistently excellent location for do-nothing tactics is the headwaters of large Carolina reservoirs where submerged islands, sandbars and cool water attract aggressive bass. After years of fishing such locations in the summer, I'm convinced that no other lure can match the big sinker and short two-hooked worm rig.

***Pete Elkins caught** this largemouth using a small worm and one of the tactics that he and his companions use to catch bass in clear water on hot days.*

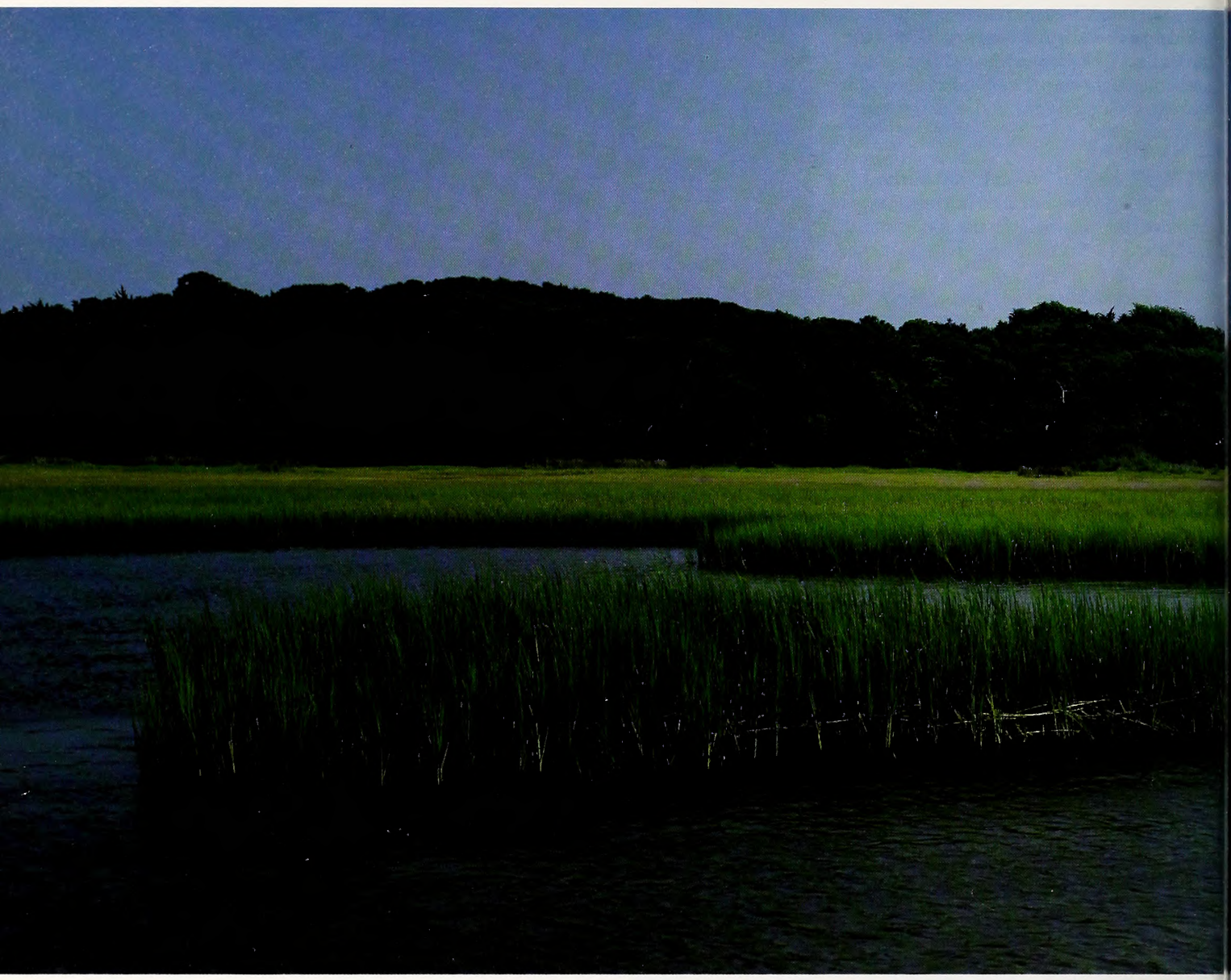
The best retrieve is truly a do-nothing one. Let the sinker hit the bottom, and then reel it back very slowly. You will soon discover that the oversized sinker provides a wealth of bottom information as it transmits signals back through the rod. It even telegraphs whether the bottom is sandy, muddy, gravel or rock strewn. Strikes are usually a distinct thud or sudden feeling of weight rather than the familiar "tap-tap" of a conventional plastic worm strike. Resist the impulse to set the hook, however, because the bass will hook itself on the small, sharp hooks. Once the fish is hooked, play it as gently as the tackle will permit because the small hooks can tear free easily.

Don't underestimate the effectiveness of this method. Above all, don't do as I first did upon viewing the rig. Thinking that the big sinker would only scare fish, I substituted a ½ ounce sinker. But after a half dozen fishless trips, I replaced it with the anchor-like 1-ouncer, and immediately began catching a lot of bass.

On frequent occasions, angling partners and I have compared the effectiveness of the do-nothing rig with a Texas rigged worm, and the do-nothing rig always outfishes conventional worms. On one occasion, the do-nothing rig caught 20 bass from a single school while Texas rigs didn't produce even a single strike.

A word on worm colors. In fairly clear water, green tints are good, but motor oil sparkle is always my first choice, followed by smoke and smoke sparkle. After that, I'll try blue or purple, but I rarely have to.

Neither of these tactics have caught fish for me in murky water, and the big sinker rig doesn't do much at night either. But properly used, both methods work exceptionally well during the summer, providing exciting, sometimes easy, and almost always effective summertime angling in large reservoirs. ☒



AN ISLAND
MOVING THROUGH TIME

Hammocks Beach State Park's history has an ironic twist, but it's part of the charm of this handsome, well-preserved barrier island.

by Kay Scott
photography by Ken Taylor

Wanted: *Semi-private island paradise on North Carolina coast. No traffic; no condos. Abundant wildlife, good surf fishing and shelling desired. Sense of history preferred.*

The cool ocean breeze was a gift. Tired of battling crowds and killer traffic on our summer trip to the beach, we went looking for a quiet alternative.

We had heard of such a place near Emerald Isle — a state-owned beach accessible only by boat allowing a limited number of visitors each day. It sounded like a haven for those who wanted to experience the coast as it used to be — a place where there were still lonely beaches and wildlife.

Nestled between Jacksonville's Marine bases and Emerald Isle's crowds, we found it. Hammocks Beach State Park, or Bear Island, is considered the "best kept secret in North Carolina." Thirty minutes from today, it yet seems centuries away.

As we turned off Highway 24, we got a hint of what was in store. A hawk circled lazily over the fields and the pine trees. The smell of salt air hung on the wind. A few miles down the access road we found the park entrance. We parked near the dock and unloaded our beach blankets, suntan lotion and bird books.

Beyond the marshes lay the island, reachable only by ferry or private boat. When the ferry arrived, we joined other visitors for the 3-mile, 25-minute ride to a barrier island virtually unchanged since it was formed by tides, wind and an ancient receding coastline.

We passed the Intracoastal Waterway

The fertile salt marshes *fringing Hammocks Beach host an impressive array of shellfish, finfish species and bird life. On the island itself live a surprising variety of mammals such as deer, bobcats and raccoons. Loggerhead sea turtles come ashore on summer nights to lay their eggs.*

A 25-minute ferry ride *transports visitors from the mainland to the island, past salt marshes, estuarine creeks and across the Intracoastal Waterway. The island is only 3½ miles long and ½ mile wide, allowing hikers to see the entire island in a day's visit.*

and a few private boats, and turned off into another well-maintained channel. In the shallow water nearby, we noticed two people wading and pulling an inner tube and bucket as they raked the bottom mud. The park naturalist informed us that they were clamming in these fertile waters, much as the earliest Indians had done.

Ahead, Bear Island's high dunes towered over clumps of vegetation. The entire island, lying between Bogue and Bear inlets, is within the 892-acre Hammocks Beach State Park; however, the ferry site on the mainland is also part of the park, separated from the island by an expanse of salt marsh, tidal estuarine creeks and the Intracoastal Waterway.

It is the only state-owned barrier island actively managed in a relatively undisturbed condition.

Hammocks Beach State Park serves an average of fewer than 30,000 visitors each year. Fort Macon State Park (near Atlantic Beach) by contrast, hosted almost 1 million visitors during 1986, no doubt because it is accessible by car.

Jesse Hines, a Park Ranger who has spent 20 years at Hammocks Beach, tells the story of a man journeying across Bear Island's dunes one night years before the land was a park. Looking ahead, he saw a dark silhouette against the sky. He figured it had to be a large bear, probably the biggest he had ever seen. He hid and waited. The bear didn't move. Finally, he fired a shot. Still, the bear remained stationary. The man reasoned that if this bear wasn't afraid of a gun, he had best remain hidden. As sunrise finally touched the sky, he crept from his hiding place, cold and stiff. On the dune was a blackened stump — his implacable bear.

The stump was probably the remnant of a fire caused by lightning in a fierce storm in 1945. The trees burned, leaving only charred stumps for reminders. Bear Island had been

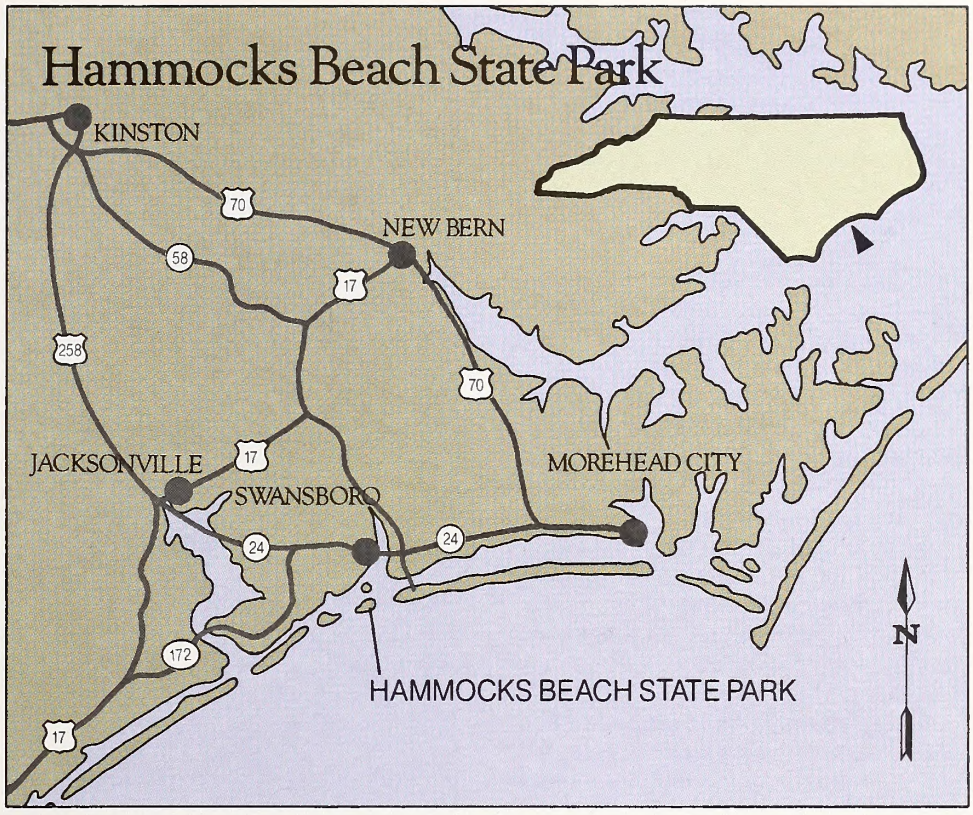
the site of an impressive stand of longleaf pines. The island did not get its name from a bear, although bears were occasionally reported years ago on the island. More accurately, it should be called Bare Island, as it was accorded that name because of its sparse vegetation.

Records for Bare Island date back to 1713 and the days of Tobias Knight, a secretary of the Royal Governor. Knight was notorious for his deals with Edward Teach, better known to coastal Carolinians as Blackbeard the Pirate. For his pains in overlooking the pirate's use of the island, Knight received a percent of Blackbeard's booty. Eventually the royal governor learned of the arrangement and Knight was apprehended. Teach was eventually tracked down and killed. Not surprisingly, tales still abound of buried treasure on the island, but none has been found.

Prior to Teach's era, the island was inhabited by various Indian tribes such as the Neusiok and the Coree. "The island, and the fertile shallow waters which surround it, supported these tribes," says Sam Bland, park superintendent. "The Indians chipped off the blue part of clam shells *(Mercenia mercenarium)* and used this as wampum (a form of money) for trading. This island really provided for most of their needs."

To look at Bear Island today, one would think that this coastal-wilderness had never been inhabited. The dunes are about 3½-miles long and about ½-mile wide. Only a few park buildings are visible from the highest point. However, in 1749, a fort was built on the western end of the island to protect the area from pirates. This fort was evacuated and burned in 1862 during the Civil War. Another building was constructed on the island by Captain Daniel Hardy and his family during the 1800s to process whales and porpoises for their oil and other products.

The island's last private owner was Dr. William Sharpe, a neurosurgeon from New York City. The area was brought to the attention of Dr. Sharpe by John Hurst, a local resident who served as a hunting guide. Sharpe had asked Hurst to find a retreat that would be beautiful, isolated and have an abundance of game and fish. Hurst succeeded when he found the 4,600 acres that included Bear Island, and Sharpe purchased the area — then known as "The Hammock" — and built a summer home which stands today. While Sharpe was away, Hurst managed the land. For many years Hurst and Sharpe hunted and fished together, forming that unique bond which occurs between sportsmen who share a common respect for the land. Sharpe so enjoyed Hurst's company that he planned to will the property to Hurst



and his wife. Instead, they convinced him to leave it to the North Carolina Black Teachers Association (NCBTA) for recreational and educational purposes. In 1950, Sharpe followed their suggestion and added the stipulation that Bear Island should be developed to make it easily accessible to visitors.

The NCBTA dreamed of a 3-mile bridge connecting Bear Island to the mainland, and by 1961 had raised $100,000 to make this a reality. However, such a bridge would have cost a great deal more than that, so the decision was made to turn the island, and land for a mainland access area, over to the state for use as a state park. That year, Hammocks Beach became a state park reserved for use by blacks as part of the days of "separate but equal" state facilities. The park was operated as a "black" state park until 1963, when the Civil Rights Act was passed and all North Carolina State Parks became integrated. The state park's system decided that a ferry was still the most practical and economical solution to the problem of access.

Hines, because of his long association with the park, has a unique perspective on the area. It is enhanced by the fact that John Hurst was his grandfather.

"During the first 10 years I was here we planted grass on these dunes," Hines says, recalling his early years as a ranger. "After awhile, we found out that we just couldn't stop Mother Nature."

Indeed, Bear Island continues to move toward the mainland. The house built by Hardy on the northeast side of the island

***Although beach users** have a bath house for changing clothes, Hammocks Beach is intended to be maintained in a relatively undisturbed condition. Limited access means that visitors to the island are assured of an uncrowded swim.*

***Wind-sculpted dunes** at Hammocks Beach State Park seem undisturbed by human intrusion. Fewer than 30,000 people a year trudge the sparkling sands of the island, making it one of the most private parks in the state.*

finds its foundation in a salt marsh, and as dunes near that house retreated toward the sound, the eroding sand uncovered forgotten gravesites.

"It wasn't unusual during those days, for a visitor to rush back to the ranger station and tell us someone had been murdered over there," said Hines. "They'd find bones sticking out of the dunes."

Walking to the forest on the mainland side of the island, you can see good examples of how a barrier island moves. The sand is encroaching from the seaward side on the forest of wax myrtles and oaks. The dunes are moving, always moving.

Walking from the ferry across the island to the beach on the hot sand can cause a rude awakening to tender feet, and visitors move quickly along the ½-mile walk. Once they reach the ocean side, visitors enjoy shell collecting, surf fishing, bird watching, photography, swimming or simply relaxing in the tranquility of this environment. Still, those who pause for a moment find signs of the island's abundant plant and animal life. Wax myrtle, red cedar, live oak and pennywort line the path for a short distance, followed by the dunes, their peaks marked by occasional bunches of sea oats. A short distance from the path, visitors may see deer and raccoon tracks crossing the dunes. There are also herons, egrets, osprey, gulls and several species of nesting terns and other shorebirds. Careful observers may see an occasional bobcat, and a bear may not be totally beyond possibility. The tracks of "dune tigers," domesticated cats gone wild, crisscross the island.

Another, more famous, visitor of the island is the loggerhead turtle. The island is a sea turtle sanctuary, and ranks as one of the most important nesting areas in North Carolina for this endangered species with an estimated 40 to 50 turtles nesting during June through August each year. Female loggerheads come ashore on summer nights to deposit their eggs in the warm sands, and are particularly active during the full moon.

"The island has a dedicated force of volunteers who work to relocate the turtle nests if it is needed," said Mike Seight, a former park superintendent. "Relocation is a long and tedious process. First, the volunteers must find the turtle crawl which looks like a single tractor tire track from the sea to the

dunes. Then, the eggs must be relocated to a nest of exactly the same dimension, and replaced in precisely the same order and depth they were found in the original nest."

Limited overnight camping is permitted in designated areas along the island. Campers must register and obtain a permit at the park office prior to going to the island. Fresh water is available on the island from the middle of April until the last week of October. (During other periods, campers must bring their own.)

A fee of $1 per person per night is charged for the use of the "family" campsites, with a $3 minimum. A maximum of six persons per group are allowed to use each family campsite. Larger "group campsites" are also available, and must be reserved in advance. Camp fires are not allowed in the park. A bath house located on the island contains restrooms, showers and baskets for swimmers. Refreshments are available during the summer at a concession stand, and there are six sheltered picnic tables near the bath house.

"Make sure your tent has 'no-see-um' netting to discourage mosquitoes and gnats," says Bland, "and pack light since you may have to carry equipment up to a mile from the ferry. Insect repellent, sun screen, water and shoes — for the cross-island trip — are a good idea."

Bear Island is closed to overnight campers during the full-moon phase of the months of June, July and August because light disturbs the loggerheads, and campers are asked to keep activities on the beach at night to a minimum during the entire period from May through September.

Access to the island is by one of two 36-passenger ferries that run daily, except during periods of inclement weather, from no later than June 1 through Labor Day. Since reservations are not accepted, be sure to arrive early. The first ferry departs the mainland at 9:30 a.m. every day, and the last ferry leaves the island at 6 p.m. Ferries depart the mainland and the island at 1-hour intervals on Mondays and Tuesdays and at ½-hour intervals Wednesdays through Sundays. The number of visitors may be limited at the discretion of the park rangers to avoid overcrowding.

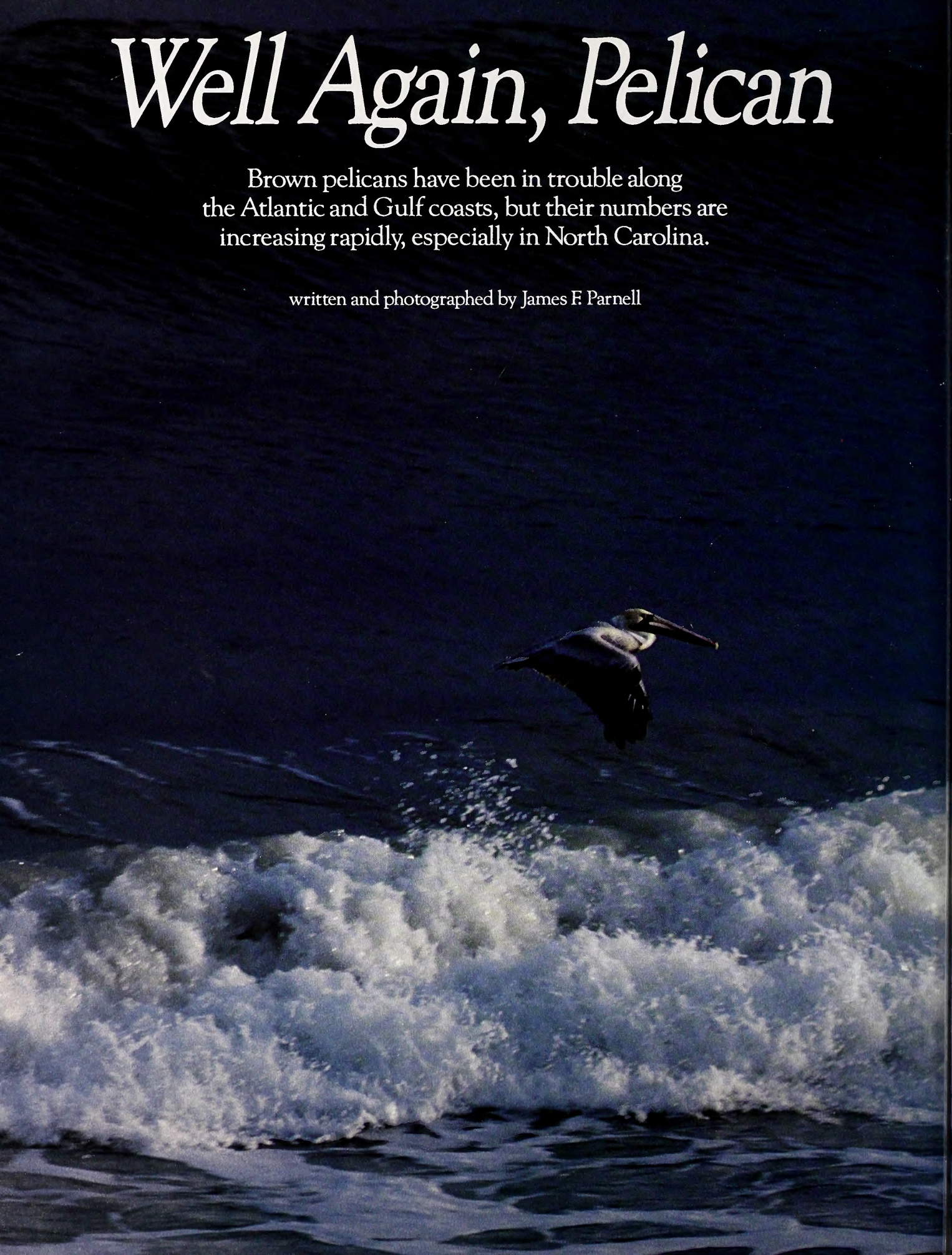
Fishing is good *in the shallow inlet waters off the island, especially during the summer when bluefish and flounder are plentiful. Family campsites are available to visitors for a nominal cost.*

For more information write: Hammocks Beach State Park, Rt. 2, Box 295, Swansboro, NC 28584, (919) 326-4881. ☒

Well Again, Pelican

Brown pelicans have been in trouble along the Atlantic and Gulf coasts, but their numbers are increasing rapidly, especially in North Carolina.

written and photographed by James F. Parnell



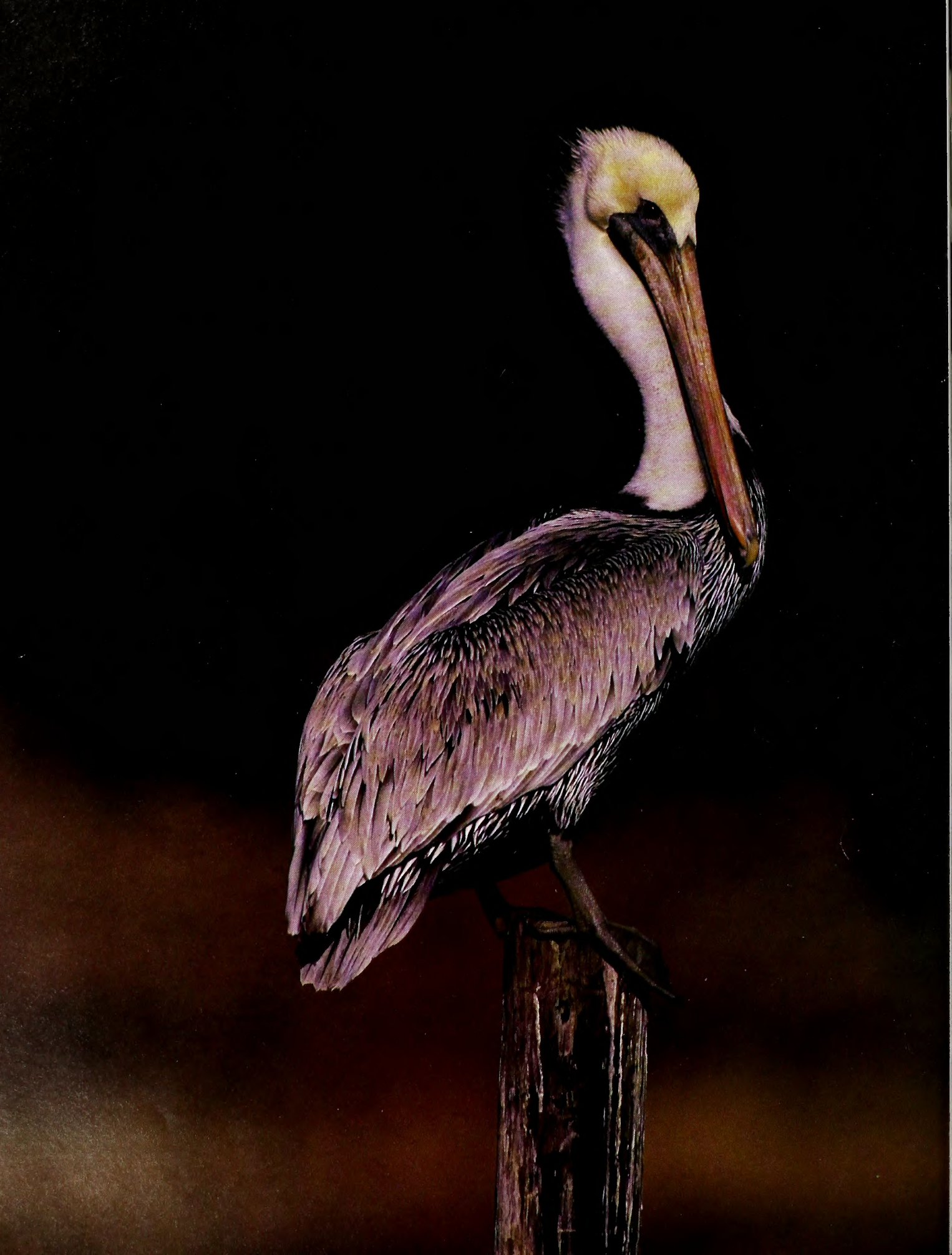
I saw my first nesting brown pelicans *(Pelecanus occidentalis)* in the early 1970s when I began surveying nesting populations of waterbirds along the North Carolina coast and found a small colony in Pamlico Sound near Ocracoke. The pelican is well known to most North Carolinians, but until recently, few people had actually seen a pelican in North Carolina, and our knowledge was mostly from books, television, or from birds seen on trips farther south.

Brown pelicans have nested in North Carolina at least since the late 1920s when a federal game warden named William Birsch reported finding 14 nests on Royal Shoal, a low island in Pamlico Sound. However, that colony was visited only sporadically by naturalists between 1929 and the early 1970s, and those occasional reports indicated that numbers of nesting birds varied from only a few nests to something over 100 nests.

I visited the Pamlico Sound nesting site annually during the early and mid-1970s, and there were usually fewer than 50 nests. During that period pelicans were occasionally seen along other sections of the North Carolina coast by tourists or fishermen, but numbers remained low.

Perhaps that was to be expected. After all, along the Gulf Coast, the species was suffering from accumulation of pesticides, and populations were declining precipitously. By the early 1960s, brown pelicans were no longer nesting in Louisiana, a traditional stronghold for the species. In south Florida, numbers were also apparently declining although not so dramatically. Pelicans in South Carolina, the most northern state with a sizable nesting pelican population, were also experiencing problems. In 1974 the brown pelican was listed as Federally Endangered because of this general decline, and there was concern that it might become extirpated from North America.

Then, in 1977, there came a ray of hope. A small group of brown pelicans was found nesting on the Cape Fear River near Southport, and numbers in Pamlico Sound began to increase. I also began getting calls from people telling me they were seeing more



brown pelicans flying over the breaking waves off our beaches or perched on pilings around boat basins and marinas. I was able to agree that, yes, there are more pelicans here.

Populations continued to increase, and by 1980, the nesting population had risen to about 500 nests with large nesting colonies at the traditional site in Pamlico Sound and on the lower Cape Fear River near Southport. Then in 1985, a third site was occupied in Core Sound near the town of Atlantic. In 1986, pelicans established yet another new nesting site in Oregon Inlet, near Nags Head, the most northerly site known for the species at that time. This colony grew dramatically in 1987, when over 800 nests were present. As of this writing, pelicans nest from Southport to Nags Head in North Carolina, and over 2,000 nests were counted in 1987. That's an increase in the nesting population in the state from fewer than 200 pairs to over 2,000 pairs in only a decade.

Scientists are not sure what has caused this dramatic increase. Reduction in pesticides in the environment may be involved, food supplies may be up, or it may be something else not so obvious. During this same period populations in South Carolina have also grown, but unfortunately there are indications that portions of the Florida population may be declining. Even so, conditions are such that Atlantic Coast populations of the brown pelican have been recently removed from the Endangered Species list.

While numbers of pelicans are increasing in North Carolina, these interesting birds have some problems. Cold winters apparently send most fishes deep, and pelicans have trouble finding sufficient food. Pelicans feed most commonly by locating fish near the surface and then plunging from the air bill-first into the water. Upon entering the water the pelican opens its bill, and the pouch acts as a large dip net taking in water and, hopefully, a fish. When the pelican lifts its head from the water, it holds the tip of the bill downward to let the water drain away. The fish is not carried in the pouch, but is swallowed right away.

Banding studies have shown that in winter, many brown pelicans migrate south to the Atlantic coast of Florida, and a few even go to Cuba. The bands are collected from birds that die before returning to North Carolina. However, many brown pelicans spend the winter along the North Carolina coast. During severe cold weather, some die. It is not uncommon to find a dozen or more dead pelicans at a roosting site when spring comes. Most of those that fail to survive the winter, however, are young birds, and most probably have not become proficient fishermen and succumb to starvation or to diseases made more severe by a lack of food.

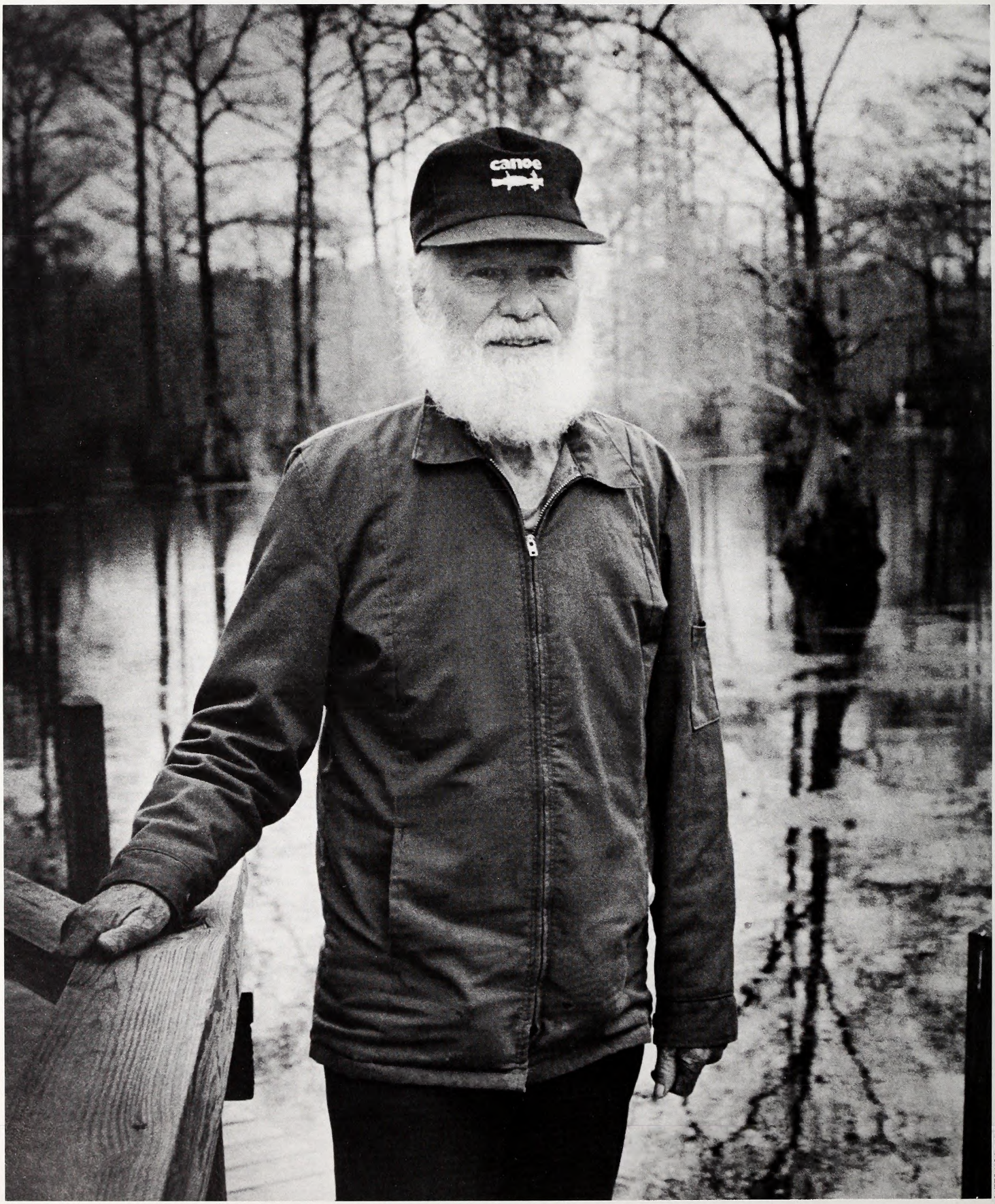
***Marina piling is** a common perch for brown pelicans along the coast (left). Listed as an endangered species early in the 1970s, the pelican has made a startling comeback. Nesting pairs of pelicans in the state have increased tenfold over the last 10 years. Pelican young are hatched and tended in nesting colonies (above), usually on spoil islands created by the U.S. Army Corps of Engineers.*

We once found pelican nests containing eggs smeared with oil that spilled from a tanker traveling up the Cape Fear River. Pelicans had landed in the oil as it covered the water, and then transferred oil from their feathers to their eggs when they returned to nests to incubate. Such pollution reduces the likelihood that eggs will hatch. I have also seen evidence of probable vandalism at one colony where large numbers of eggs disappeared under unusual circumstances.

Each summer, as a part of efforts to monitor the success of these colonially nesting birds, I visit most of the nesting sites and have the opportunity to witness the breeding cycle of these most interesting birds. Brown pelicans usually do not breed until they are three years old, the age at which they first attain the adult plumage characterized by the white head and brown neck. Immature birds are a more uniform gray-brown color. Flocks seen along ocean fronts and around marinas often contain both adults and immatures.

Nesting begins in early spring, with nests generally placed on the ground on small islands in or near inlets. In North Carolina, most pelicans now nest on the dredged material islands created by the U.S. Army Corps of Engineers during maintenance of coastal waterways. One to four eggs are laid, with three being the usual number. These hatch in about four weeks into blind, naked chicks that only a mother pelican could find beautiful. After about two weeks, however, a white down emerges and the chicks soon become more presentable. They are fed regurgitated fish by both adults for about nine weeks before they attain flight. At this time chicks are usually very fat and may actually weigh more than their parents. This fat becomes an important source of energy while they learn to become proficient at catching fish. In North Carolina, it appears that about one young pelican reaches flight for each nest begun, and this ratio is similar to that found in areas farther south.

Although this new wealth of pelicans is being enjoyed by many along the North Carolina coast, it may also be a good sign in another sense. These fish eaters are high on coastal food chains, and perhaps their success is an indication that our coastal environment is still relatively healthy. Of course, weather may also be an important factor since most recent winters have been relatively mild along the coast (in one recent winter, pelicans suffered greatly during a severe cold period and many died). But while a series of severe winters could be disastrous and could result in the species pulling back to more southern climes, brown pelicans are now moving north. In 1987, they nested for the first time in recorded history on the eastern shore of Maryland and Virginia. We can only hope that these magnificent birds continue to be an important part of our coastal birdlife. ⊠



LAWRENCE S. EARLEY

THE MAN WHO LOVES SWAMPS

interview by Lawrence S. Earley and Alan Eakes

A.B. Coleman has spent much of his life canoeing and slogging through wetlands, and his greatest love — and legacy — is Merchant's Millpond.

JANE ROHLING

A.B. Coleman — *backpacker, canoeist and lover of nature — donated the land that became Merchant's Millpond State Park.*

Seventy-five year old A.B. Coleman speaks with a fine intolerance about what he considers confusion. Cities are confusing, he says; so are highways and cars, and even houses and the people in them. That may be why for most of his life Coleman has sought escape of one kind or another, even while raising a family.

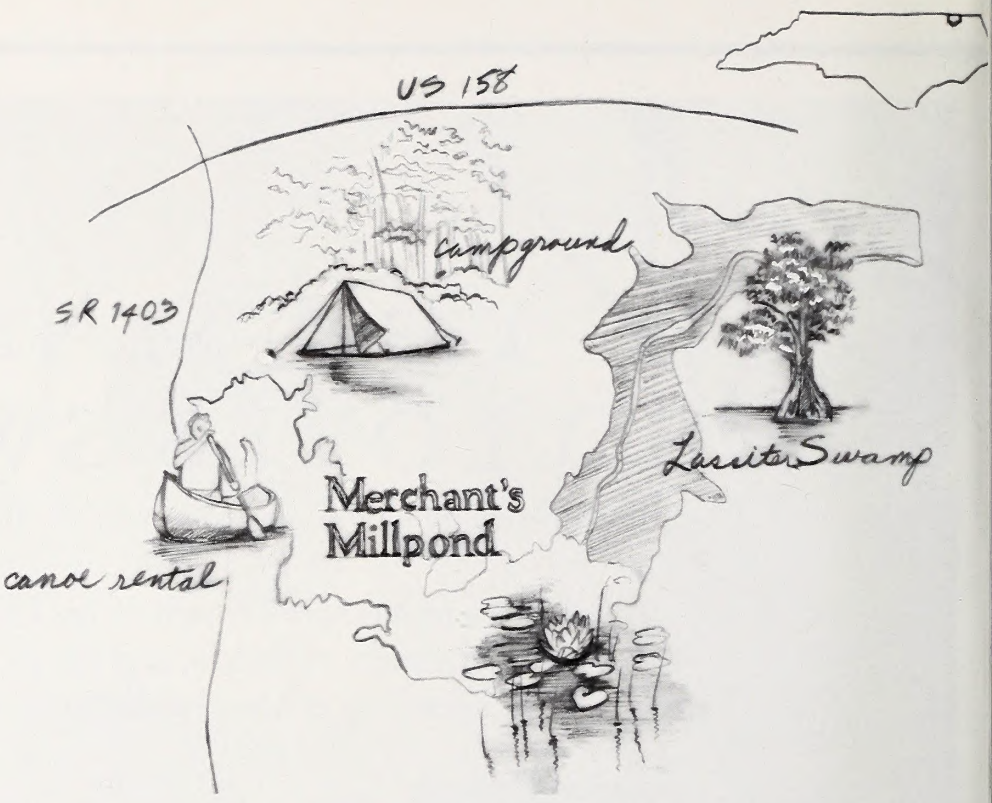
The escape he craved tended to be outdoors, especially the swamps around northeastern North Carolina where he lives. In his later years he's ranged more widely: the Northwest coast, Alaska, the Arctic, Hawaii. In his fifties and sixties he went on repeated wilderness expeditions in Alaska, either solo or with his son Mike. Although he admits to slowing down now in his seventies, he still walks several miles every day with a 50-pound weight in his backpack and he canoes 3 miles a day in his beloved swamps. He maintains a lofty contemptuousness of home life, or "life in the womb," as he calls it. "There's nothing wrong with being hungry," he says. "You're so much more intelligent when you wake up in the morning hungry, wet and cold."

Though a successful developer in his middle years, Coleman is perhaps best known to North Carolinians for donating Merchant's Millpond to the state. Since 1974, when the 919-acre gift officially became a state park, Merchant's Millpond has annually attracted thousands who come for the moss-draped picturesqueness of a classic bald cypress swamp, for the deep quiet in the ancient corners of the millpond.

"You got to do things for reasons other than money if you're going to accomplish anything in life," he explains his donation. And indeed his feeling for land and its values approximates the land ethic that Aldo Leopold described in his landmark book, A Sand County Almanac.

Wildlife in North Carolina visited A.B. Coleman in the ranger's office at Merchant's Millpond one day in March. We asked him why he parted with a piece of land he loved so dearly. And we wondered about his fierce determination to prove for himself that age needn't dim one's appetite for life.

Carolina Profile



I was born and raised in Kentucky. My mother died when I was five. I suppose I had a reasonably happy life, but I couldn't stand the confusion around the house. Whenever I got my jobs done at home, I'd leave and go to the woods. Our house was the last house back in the big woods there. It was total wilderness.

I found that by going out I could make my own world. If the tension in your life is great enough, you will either collapse from the strain or you will build your own world. I was a loner and I kept going deeper and deeper into the woods. I was totally fascinated with it. There were beautiful trees, locust trees with a beautiful fern.

It was my world. I had some big hollow trees and old caves that I could sleep in. Half the time I didn't have enough clothes and sometimes not enough food, but I could always sleep in a hollow tree.

I guess that's the reason why I got so interested in Nature. I like anything that's natural.

I left my home in Kentucky when I was in high school and came to Swannanoa, North Carolina, to Presbyterian Board of Mission Farm School. That's Warren Wilson College now. Basically I was already on my own and I worked my way through high school. I went a year and a half to Maryville College in Maryville, Tennessee. Then I moved to Louisville, Kentucky, and worked there for awhile and then moved to Cleveland, Ohio. I joined the Navy when I was 21 years old. I spent my 20 years in the Navy and loved it. I was based over here in Portsmouth Navy Yard in Virginia. That would have been about 55 years ago.

I wanted to get out and find the Great Dismal Swamp. Every weekend I'd catch the bus and come out here and go trying to find it. I mean, I'd wade through them briers and everything else and I'd ask the people, "Where's the Dismal Swamp?" "Oh, that's down in North Carolina," they'd say. "You got to go to North Carolina to get to the Dismal Swamp." I'd come down to North Carolina, see the same thing, briers and brush and everything else. See, a swamp area that's wet is an orderly place. It's got a certain drainage pattern and the swamp heals itself. But that area was just confused. It had been burned out so much and so many ditches were dug into it that the natural drainage pattern had been changed. The beavers had all been trapped out.

I'd heard so much about the Dismal Swamp I was just real disappointed. I'd say, "There's got to be something else in this Dismal Swamp. This ain't appealing to me."

I happened to own this piece of land in Suffolk. It was an old Civil War battlefield and it had historic interest and had quite a bit of ecological interest and it was considered the gateway to the Dismal Swamp. And it had a little creek that never ran dry. I knew that it would terminate someplace so over the years I started following it. The further I got the wider it got and then when I reached Lassiter Swamp, why then I began to take a canoe and I'd hide the canoe back up in the swamp there. That's the beauty of a canoe, you know. I could hide it and then walk back to it and not have to take it back and forth to the ship.

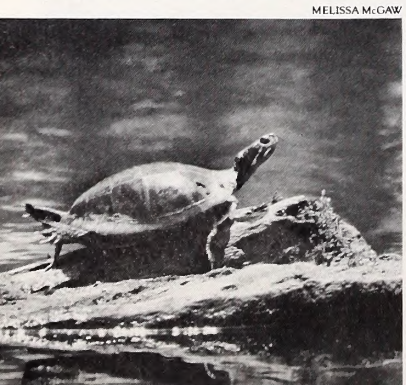
So I began to explore on down in Lassiter's Swamp until I got down here to the spillway at Merchant's Millpond. I'd seen enough real small swamps that I knew what a swamp should look like. And when I finally got to the millpond, I said, "My God! This is it!" To me, it was the perfect swamp. And I said, I will buy this piece of property some day. It took me 10 years to buy it but I finally did, in 1968.

My son Mike and I had it practically to ourselves. To us it was just a paradise. I had always thought that the Everglades was the best place or Crystal Springs. Mike and I went down to look at the Everglades, but the millpond was prettier than that. We went to the Okefenokee. And the expanse there is fantastic, you know. It's so big. But it would take you two or three weeks in the Okefenokee to see what you could see in Merchant's Millpond in four hours. We even went to look at the beautiful swamps in the Hawaiian Islands. Every place we looked, Mike would say, "Dad, the millpond is prettier than this."

I started to get phone calls. Some scout leader would say, "We've got 15 scouts up in the Dismal Swamp. And they've all built up their anticipation and we've spent three days here and haven't seen nothing." And he says, "Somebody says if anybody could tell him where the Dismal Swamp is and what to do, you could."

Well, I got to bringing them over to the millpond. Everybody was just crazy about it. I had people from England and Australia who would come down here and tell me that this was the most beautiful place there was.

MELISSA McGAW



***"North Carolina's got** the best swamps in the country," Coleman says, and of them all he believes Merchant's Millpond is the most picturesque. The open water offers pleasurable canoeing past vistas of bald cypress.*

MELISSA McGAW

***Coleman donated 900 acres** of swamp and upland because he believed that the millpond was too pretty to be developed and thus destroyed. He says, "If your causes are not worth the sacrifice, then they're not causes."*

But then about 1970 or '71, why it was obvious to us that things were changing. People were going farther and farther into the millpond. And I could see the handwriting on the wall. Now I was in the land-development business. I could have made several hundred thousand dollars by coming up here and selling lots. But I told Mike, "Son, I can't develop the millpond. I can't come in and deliberately spoil an area like that regardless of how much money we'd make."

I had wanted to give the property to Mike. I told him I'd deed it to him and he could do whatever he wanted with it and I wouldn't come back. Or, we could deed it to State Parks. I told him, "Now son, you're going to have to get it through your head that if we do this, there can't be one penny come to our pockets from the transaction." I told him that because you have to be sincere in life. You have to live what you believe. And if your causes are not worth the sacrifice, then they're not causes.

Mike said, "Let's deed it to Parks."

That's when I contacted Mr. Philip Godwin, the attorney in Gatesville, and he was the first to contact state parks. Mr. Tom Ellis, Superintendant of State Parks, came out and looked at it. And I hadn't told them what my intentions were. I just told them I had an area that they should investigate. And I took him to the pond, and when Mr. Ellis came back, I asked him how he liked it. He said it was beautiful. I said, "Well, if you'll put a state park here I'll give it to you." And that's all that was said.

People ask me how come I could give away such valuable property. One reason is, I could afford to. When I was making those canoe trips, I was discovering all these beautiful properties hidden away in the swamps. I began to realize that there were properties that you couldn't develop and make money on and properties that you could. Everybody said, "It's swamp land. It's worthless. It ain't no good." But I knew where the good land was. Sometimes it was just a question of getting across a little bitty swamp until you had beautiful high ridges. I bought some of those properties and broke them up into three-acre farms, five-acre farms. I'd put in a culvert and road or two and everybody could drive back. So I had money coming in and I could afford to donate the millpond.

But I also believe that you got to do things for reasons other than money if you're going to accomplish anything in life. You need to love and have a feeling of stewardship for the land. The questions shouldn't be, how much you developed it or how tall a building you

put on it. Did you enjoy it for your lifetime? Did you have your family on it? Did you leave it like it was?

A man can't own land for any more than his lifetime. Compared to some of those cypress trees back in the swamp that have to be 1,500 years old, our lifespan here is just a snap of the fingers. Land was here a long time before you came and it will be here for just as long after you leave. So I don't feel that we really own anything.

North Carolina's got the best swamps in the country. There's no better anywhere. And I've spent a lot of time in them, especially the ones around here. I raised two little coons down here near Panther Landing where I live. Their mother got killed on a highway. I raised them until they got big enough to go. Two little females. One of them I called "Pretty Girl." She was awfully friendly. That little coon dearly loved me. She'd ride a bike with me and stay right with me. But they had to be free, so I turned them loose. They'd come back every day and I'd feed them, but then they had young ones and I didn't see them. Never knew what happened to them.

One cold night I was sleeping in my shelter near my house. I don't live in a house now. I have a shelter that's next to the Northwest River away from the house. I'm warm and dry, don't get me wrong. It was one of the coldest nights we had, 5 degrees and snow on the ground. And I saw a coon track in the snow around where I had raised these little coons. I wondered whether that could be Pretty Girl. So that night I had some food all ready, and so help me Pretty Girl came back and scratched on the window. That would have been four years later. She was hungry. She was in trouble. I'll never forget it. I opened the window and put the food out there for her. I'd talk to her and she sat right there and ate the dog food I gave her.

She remembered after four years to come back and get help. You have to know that we aren't the only creatures out there with intelligence. If we think we are the supreme being, master over everything else, you have to know I would question that.

I don't ever know what's going to happen down where I am. I get up every single morning and I don't have the slightest idea who's going to call or what's going to happen or what I'm going to do. If things don't move around a bit, then I got to take my backpack or canoe and begin scaring up some excitement somewhere.

Life has to be thrilling, exciting. I mean, we got to have things to keep us mentally and physically active. And it's so much fun to walk that razor edge where one wrong step would be death. And to make it. I've done it in Alaska, I've done it above the Arctic Circle, I've done it in canoes in an ocean. And I'm still doing it. Maybe I'm addicted to my own adrenaline. But it's fun. It sure is fun where you can look back over the trail and say, "It was close, but I made it."

In 1982 I tried to paddle in a canoe from Panther Landing, my property on the Northwest River, to Wilmington, North Carolina. That was a little ambitious, I'll tell you.

It took me 10 days to get to Ocracoke and I got caught in that strong tide — it's an awful tide that sweeps out there. I mean 18 knots. It swept me out to sea. When the moon reaches a certain point, the tide changes instantly. You have that first big wave that is brutal, and when that wave hit that canoe I couldn't get it around. It hit broadside. But I had my gear stowed right and nothing shifted. I rode it out and only shipped a gallon of water over the covers I had on the canoe.

I was swept out to sea, but after you pass that first wave, a canoe rides easy then. I don't care how high the waves are, even if they're 50-feet high, a canoe will just ride right on top of it. But you've got to navigate every wave.

So I got out there and waited for the tide to change, and I rode the current back in to Ocracoke. I'd had enough of that ocean. I'd had enough of that paddling. I called my wife and I says, "Honey, come on down to Ocracoke and pick me up."

Beginning when I was 57, I went to Alaska every year for 10 years. I backpacked sometimes and canoed other times. But before I went I did my homework. I exercised and practiced. I'd get up the first thing in the morning and run. And then I carried this weight on my back. I mean, you can't suddenly pick up a loaded backpack and hike. You can when you're younger, maybe. So I'd exercise. I'd walk so many times with nothing on my back. Then I'd carry the backpack. After awhile I'd put a 100-pound block of iron in it. And I'd walk up and down steps.

That meant that I could comfortably pack 70 pounds in Alaska and go into the wilderness for two weeks at 32 degrees. I knew what temperature range I could work with. I knew what weight I could work with. I knew what food I could carry and how long it would last me. I knew what I could do.

When I was in Alaska, I would take two-week trips. Once I paddled alone out of Valdez, which is in Prince William Sound, in a covered canoe. I would sleep in the canoe because you got to. Because those grizzly bears roam the beach and because it's dangerous. The first time you go in a big glacier it's awe-inspiring. Icebergs breaking and falling down and the ocean is churning and there are ice floes everywhere. Killer whales swimming back and forth.

But then you begin to get brave. You become part of the environment. You work a little closer. A little closer. You challenge nature, see how close you can come with safety. You're confident because you did your homework. Confident because you paddled that canoe through the swamps. Confident because you exercised every morning. Confident because you carried that block. You feel sure of yourself. Then you challenge it. You shoot that five-mile Columbia glacier right down the face of it with that canoe by yourself. What a thrill!

I'm still canoeing and still going. But it's getting harder and harder. I have to exercise more. And I'm having to go to lighter boats all the time. I've just ordered a boat that weighs 30 pounds, where I used to handle the 70-pound Grummans with ease. I have to go by myself now because I can't keep up with the faster groups any more. And I'm down to carrying only 50 pounds in my backpack every day. But the fact that I can't carry 100 pounds and go out into the wilderness for two weeks doesn't excuse me from doing the best I can. You have to do the best you can. Well, what is the best you can do? I'm still trying to find out. I still have to test myself every morning and then I really have to put myself to the challenge.

So I'd ask you and I'd ask everybody. Are you doing your homework? Are you doing your homework to prepare yourself for when you're 75? Are you doing your homework to keep from being a burden to your children? Are you doing the best you can for yourself? ⛒

"Carolina Profile" is a periodic feature in Wildlife in North Carolina. *In these interviews, men and women reflect on their outdoor experiences and on what the land and its resources mean to them.*

KEN TAYLOR

CLOSED AREA
UNLAWFUL TO TAKE
OYSTERS OR CLAMS
MAY CAUSE SERIOUS ILLNESS
OR DEATH
N.C. MARINE FISHERIES

BOATING BY-PRODUCTS

When too many boats concentrate in fragile marine habitats, the problem of pollution sometimes comes to a head.

written and photographed by Mark Taylor

"Hoop Pole Creek," Wayne Mobley shouts, pointing towards a large salt marsh on the near shore. He throttles back, and begins easing the boat into the shallows. He goes aft and dips a sample bottle into Bogue Sound while Bob Benton takes the wheel. "A great place to gather oysters and clams," says Mobley. "This area was almost lost to a big condo and marina development a few years ago, but they didn't get all their permits."

Benton is supervisor of the N.C. Division of Health Service's Shellfish Sanitation program, and Mobley is a shellfish sanitarian. Their job, quite simply, is to see that you don't eat polluted shellfish and get sick. They do this by monitoring the state's coastal waters for bacterial contamination, and recommending the closure of shellfish areas found to be unsafe. Oysters and clams in particular are a problem because they filter food from the water. If pollution is present, these species may concentrate the bacteria and organisms that cause infectious hepatitis, salmonella, cholera, and a host of gastrointestinal ailments.

Although Benton and Mobley are primarily concerned with protecting public health, their jobs have given them an excellent perspective on the overall health of North Carolina's coastal waters. The prognosis is not good. Along heavily developed portions of our coast — such as in Brunswick County — over half the shellfishing waters are closed because of bacterial pollution. There's no single cause — urban and residential runoff, discharges from municipal sewage treatment plants, and leaking septic tanks all play a part. Increasingly, however, the fight for clean water is focusing on new marinas.

"We're losing the battle for water quality in coastal North Carolina," says Benton. "It's not that our waters are grossly polluted, but you need very clean water to support a shellfish industry. We're talking about being able to take an oyster or clam from the water, open the shell, and safely eat it raw on the spot any day of the year. It takes very little pollution to contaminate these shellfish."

Benton says marinas pollute in two ways — through occasional discharges of raw sewage from marine toilets, and through stormwater runoff. "Even a single discharge can contaminate nearby shellfish," Benton says, "because the waste is so fresh, and there's been no die-off of bacteria. Because of the threats to public health, waters around marinas are automatically closed to shellfishing. The size of the closure depends on the type and size of the marina.

"Stormwater runoff from buildings, parking lots and other impervious surfaces at a marina — or any other development — may also cause bacterial contamination. This runoff may contain bacteria from animal droppings and overflowing septic tanks in addition to heavy metals and oil and gas residues."

Although a marina is a single facility, each boat is a potential polluter — and irresponsible boaters are the sole source of raw sewage entering the water. Small boat owners, for example, may choose to empty the contents of a waste bucket or porta-potty over the side in the middle of the night instead of walking up the dock to use the marina's restroom. Similarly, small yachts often have toilets which empty wastes into holding tanks. With the flip of a valve, the holding tank may be emptied through the hull into the water. These tanks should either be pumped out into the marina's sewage system or be discharged into the water more than three miles from shore — a practice Coast Guard regulations allow. The laws are difficult to enforce, however, and holding tanks are occasionally emptied at the dock — a practice marina owners deplore.

"We run a clean marina, but you only have so much control over individual boaters," says Bruce Fetzer, owner of the Spooner's Creek marina near Morehead City. "Unless you're standing right there you'd never know if someone were discharging their

***Organic pollution from** boats and marinas often results in the closure of shellfishing waters. The problem is compounded in heavily developed areas, such as this creek in Carteret County, by leaking septic tanks and runoff from shorefront development.*

***Wayne Mobley takes** a water sample near the Spooner's Creek marina. Although the water found in marinas is clean most of the time, the discharge from a single boat toilet or "head" can contaminate nearby oysters and clams. Waters around marinas are automatically closed to shellfishing because of the threat of infectious hepatitus and gastro-intestinal illness.*

holding tank into the water. I don't think it's common, but if the truth were known, I'm sure some boaters dump stuff overboard at night."

Not surprisingly, some marina owners are reluctant to install expensive systems to pump out holding tanks. Most marinas charge a small fee for this service, and many who have made the investment find that boaters seldom use their expensive facilities.

The problem of marina pollution is compounded by the sheer size and growing numbers of marinas in coastal North Carolina. Most marinas in the past have been small, full-service facilities that dock and repair boats. Increasingly, however, marinas are being included in condominium or residential developments. In 1987, there were 246 marinas in North Carolina's coastal waters, and 43 were associated with condominium or housing developments. Some of these projects are large. One condominium development in New Bern has slips for 340 boats, and a proposed development in New Hanover County called for 1,000 boat slips, although no permits were issued. The incentive for developers to include a boat slip with a house or condo is high — it may add $10,000 to $30,000 to the price of a unit, depending on its location.

The price we pay for this coastal building boom, however, is deteriorating water quality. "Currently, we receive anywhere from 12 to 20 applications for new coastal marinas annually and most of these are associated with some sort of residential complex," says Preston Pate, assistant director of the N.C. Division of Coastal Management, which reviews permits for coastal development. "This has been the trend for the last five or six years — everyone wants a place to keep a boat. As the Outer Banks become more developed and land costs rise, developers are turning to the sound side of the barrier islands and the mainland. Of course, this is where the best shellfishing is."

Most of North Carolina's inland coastal waters — the sounds lying between the Outer Banks and the mainland — are classified as shellfishing waters. These waters have traditionally supported a commercial harvest of shellfish, and many still do.

The total area of shellfishing waters closed because of pollution is relatively small — approximately 51,000 acres. However, those areas most vulnerable to pollution — the small creeks and shallow waters near shore — are also the most productive.

"It's not the size of an area that counts so much as its productivity," Bob Benton explains. "You might have a thousand acres of open water in the sound that don't produce as many oysters and clams as a few acres of shallow water at the mouth of a creek. If you lose those few acres, you've really hurt the fishing. The areas with the biggest increase in closed waters in the past few years are also those which have been most heavily developed — the waters around Wrightsville Beach and Topsail Sound in New Hanover and Pender counties and Bogue and Core sounds in Carteret County. These waters, from Carteret County south to the South Carolina line, are excellent producers of clams and oysters."

Several laws regulate marina construction along the coast. One effective regulation prohibits marinas

that require dredging in designated primary nursery areas — the marshes and shallow areas that produce most of our fish and shellfish.

"This regulation probably affects marina siting more than any other," said Pate. "The same protected waters which nurture most of our finfish and shellfish make excellent locations for marinas. Some dredging is required for almost any marina, so this is one of the easiest decisions we can make. We just say no. Wetlands are also well protected under state and federal laws, and marinas can't be built if they cause significant damage to wetlands. These laws make it difficult to site a new marina."

Another regulation prohibits marinas being located in shellfishing waters if their location would result in the waters being closed by the Shellfish Sanitation Office, or if they would affect the traditional harvest of shellfish.

If current regulations protect shellfishing waters, primary nursery areas, and wetlands then why the furor over new marinas? Many conservationists believe that the stringent regulations governing marina development are still not adequate to protect our waters because of the sheer size and cumulative impacts of many new projects.

"Many large, new residential developments that include marinas are proposed for the most undeveloped portions of our coast, and border our most pristine waters," said Todd Miller, executive director of the North Carolina Coastal Federation. "Although there are regulations governing marina siting and stormwater runoff, we don't feel that the cumulative impacts of single or multiple projects are adequately addressed.

"The new stormwater runoff regulations, for example, allow the use of engineered systems that often fail if they're not adequately maintained by the developer. This means that some of these areas will probably have to be closed to shellfishing eventually. It would be much better to confine marina construction to developed areas which are already closed to shellfishing than to risk losing more of our shellfishing waters."

One alternative to "wet" marinas that promises to reduce pollution is "dry stack" marinas. In these facilities, boats up to 25 feet in length are stored on racks in huge buildings near but not in the water. Forklifts move boats to and from the water whenever they are used. Dry stack marinas lack many of the environmental problems associated with "wet" marinas.

"We built our dry stack marina in 1976 because land was so expensive," said Jerry Macon, owner of the Fort Macon Marina in Atlantic Beach. "We have over 200 boats in dry storage, and feel we play a very minor part in any water-quality problems. We don't have any wet slips, so boats aren't in the water overnight. This eliminates problems with people discharging wastes from heads."

Pate agrees with Macon that dry-stack facilities are an excellent alternative to wet marinas. In fact, dry stack marinas are exempt from the regulations restricting marina development in primary nursery areas or shellfish waters, which make wet marinas so difficult to site. However, they must still comply with coastal development regulations protecting wetlands and controlling stormwater runoff.

"These facilities also provide more public access to the water than wet marinas of the same size because they can handle more boats," said Pate. "Another plus is that they don't have large pier networks, so there's little loss of public use in the adjacent waters."

Even in early April, the waters of Bogue Sound are busy. Bob Benton and Wayne Mobley have finished collecting their water samples, and as we head back to the boat ramp we pass several clammers. Lining the shore on this sunny day are boats, docks, trailers, condos, houses, an occasional undeveloped salt marsh, and the small green signs which announce that this area, too, is closed to shellfishing.

"The waters of Carteret County provide excellent oystering and clamming, but almost 8,000 acres are closed because of pollution," Benton shouts over the motor. "That's up 43 percent over the past seven years."

He waves at the shore. "It's not just the boats, or the marinas, or the condos. It's the cumulative impact of everything we do near the water. It's not enough to protect just the shoreline — we need to look at the whole coastal environment. If we want clean water and safe shellfish down the road, we have to make the choices now." ⊠

Our Threatened Shellfishing Waters

Location	County	Acres Closed To Shellfishing 1980	1988	Percent Increase
Calabash	Brunswick	985	1,051	7%
Shallotte River	Brunswick	145	229	58%
Lockwoods Folly River	Brunswick	250	517	107%
Carolina Beach	New Hanover	300	360	20%
Masonboro Sound	New Hanover	212	282	33%
Wrightsville Beach	New Hanover	472	557	18%
Topsail Sound	New Hanover/Pender	30	313	943%
Stump Sound	Pender/Onslow	155	295	90%
Hurst Beach	Onslow	75	160	113%
Bear Creek	Onslow	25	70	180%
White Oak River	Onslow/Carteret	1,392	2,613	88%
Western Bogue Sound	Carteret	133	141	6%
Central Bogue Sound	Carteret	50	117	134%
Eastern Bogue Sound	Carteret	135	324	140%
Morehead City	Carteret	1,011	1,284	27%
Beaufort and North River	Carteret	1,050	1,166	11%
Harkers Island	Carteret	0	30	
Core Sound and Jarrett Bay	Carteret	70	240	243%
Nelson Bay	Carteret	166	351	111%
Hatteras Area	Dare	200	575	188%
Roanoke Sound	Dare	986	1,786	81%
Croatan Sound	Dare	550	840	53%
Totals		**8,392**	**13,301**	**58%**

52 Schools Compete In Annual Event

West Davidson Wins Hunter Safety Shooting Tournament

Written and Edited by Mark Taylor

West Davidson High School students from Davidson County shot their way to top honors last spring in the 10th annual N.C. Hunter Safety Shooting Tournament. In the junior division, Forbush Elementary School in Yadkin County also set a state record with its shooting.

Over 400 students representing 52 schools participated in this year's tournament, held in Kinston. The West Davidson school senior team will travel this month to Indiantown Gap, Pennsylvania, to represent North Carolina in the North American Hunter Education Championship.

The West Davidson senior team scored 2,290 points out of a possible 2,400, while the Forbush junior team set a state record for the junior division with 2,215 points. Ramie Spainhour of West Davidson High School scored the highest individually in the senior division with 588 points out of a possible 600 points. Jason Poindexter of Forbush Elementary also set a new state record in the junior division with his score of 569 points.

Although students competed only in trap, rifle and archery events to score points toward the championship, safety officers took them to nine stations on a hunter trail to test their knowledge of game and wildlife laws, hunting safety and skills. They were instructed to identify wildlife, judge distances and in some cases, tell the kind of firearm or bow and arrow they would use.

"For many of these kids, this is the highlight of their year," said Capt. Wilton Pate, chief safety officer for the Wildlife Commission. "It gives them an opportunity to use what they've learned in hunter-education courses."

More than 150 volunteers were on hand to help with the tournament. They represented the Seymour Johnson Air Force Base, the N.C. Wildlife Federation, the N.C. Rifle and Pistol Association and wildlife clubs from Pitt, Lenoir, Guilford, Cabarrus and Onslow counties.

— *Angela Hill*

KEN TAYLOR

Top Juniors: *Forbush Elementary School took top honors in the junior division of the 1988 N.C. Hunter Safety Shooting Tournament. Coach Larry Doub and his students are congratulated by officials from the Wildlife Commission.*

KEN TAYLOR

Top Seniors: *West Davidson High School took top honors in the senior division of the 1988 N.C. Hunter Safety Shooting Tournament. Wildlife Commission Capt. Wes Cook, Lt. Mike Lambert and Capt. Wilton Pate join Coach Kevin Long and his students.*

Fire Destroyed Records

Seeks Genealogy

Dear *Wildlife:*

Recently, someone lent me a copy of the January 1988 issue of *Wildlife in North Carolina* containing the article on Daniel Boone, entitled "Long Hunter of the Yadkin."

My husband, Lawrence Daniel Boone, and I both really enjoyed the article. It had some very special meanings for us — he is descended from Daniel Boone, and is also a blacksmith. My husband was born in Burnsville in 1937, and grew up in and around Asheville.

We have made some attempts at tracking back to the original Daniel, but some of the history is not too clear. My husband's uncle, also named Daniel, had done some research and claimed that he was a sixth-generation direct descendant of the old long hunter.

However, there was a fire in the Yancey County Courthouse and many records were destroyed. We're still not sure if the line is direct or not.

If you or any of your readers have information that would help us, we would appreciate hearing from you.

— *Judy Boone*

Editor's Note — When Squire Boone, Daniel's father, came to North Carolina, he brought his nine children with him. Although Daniel and his younger brother Squire later moved to Kentucky, many of his brothers and sisters — plus their children — probably stayed in the Piedmont. Readers who have genealogical information on the Boones may write to Mrs. Judy Boone, 137 Hedgewood Drive, Greenbelt, Maryland 20770.

Summer Boating Has Special Problems

Booze And Boats Recipe For Accidents

Summer brings thousands of boaters to North Carolina, and the weekend of July 4 is considered the busiest of the season. Officials with the N.C. Wildlife Resources Commission offer these tips to boaters to help them avoid any boating accidents during the holiday.

"If we could tell people only one thing, it would be to leave alcoholic beverages at home when they go boating," said Colonel Harold Ragland, chief of the Wildlife Commission's Division of Enforcement. "Studies nationally and in North Carolina show that a high percentage of the operators and victims in fatal boating accidents would have been considered legally drunk if they had been operating an automobile. Even small amounts of alcohol can slow a boater's reflexes and reduce alertness, especially after spending a day in the sun and wind. Bring plenty of soft drinks or other beverages to prevent dehydration in the hot sun, but leave the beer at home."

Ragland adds that families with small children need to be especially careful. "All children and nonswimmers should wear Coast Guard-approved personal flotation devices (PFDs) at all times. Also, be sure that children are under control and seated when the boat is under way. We occasionally see parents who let their children roam about or even sit on the top of the bow when the boat is moving. This is extremely dangerous. It's not hard to fall overboard or be thrown from a boat at high speeds."

The number of boats on the water also calls for extra care and courtesy. "Be sure you're familiar with the rules of the road, and exercise them," said Ragland. "Also, be courteous. Slow down for other boats, and give sailboats, fishermen and water skiers plenty of room. It's also a good idea to not spend too much time on the water. It's surprising how tired you can be from a day's boating, and fatigue plays a big role in boating accidents. Taking a break, and getting off the water for a few hour's rest during the hottest, brightest part of the day can be a big help."

Ragland adds that reckless and drunken boating is a crime. These incidents can be reported (get the boat registration number if possible) to the Wildlife Commission's 24-hour, toll-free Wildlife Watch Hotline at 1-800-662-7137.

Good Reading

Grouse and Grouse Hunting (186 pp.) and *Timberdoodle* (116 pp.) by Frank Woolner. 1987. Both $18.95, hardcover. Published by Nick Lyon's Books, 31 West 21 Street, New York, New York 10010.

Frank Woolner is best known as the long-time editor of *Salt Water Sportsman* magazine, but he is also an avid bird hunter. Both of these books were published in the early 1970s and quickly became classics in hunting literature. Fortunately, they have been reissued by Nick Lyon's Books.

Grouse and Grouse Hunting and *Timberdoodle* are more than how-to books that will help you fill a game pouch. Both chronicle the natural history, hunting lore, guns and techniques needed to bag the elusive partridge or woodcock. Woolner has spend decades in pursuit of both, and his love of birds and land shine in his simple, eloquent prose.

Favored By Old Timers

Turn A Turtle To Soup

Many of the farm ponds and rivers scattered across North Carolina hold snapping turtles. Many people have little use for snapping turtles, but a few old timers still remember when turtle stew was a great delicacy. Snapping turtles are a lot of trouble to clean or prepare, but if you enjoy catching them try this recipe for turtle soup by Susan Sharpe of Hamlet.

Turtle Soup

2 pounds turtle meat
2 Tb. flour
1 small piece of ham
1 piece of lemon
Chopped onion, cloves, garlic, bay leaf, thyme, parsley
Salt and pepper

Cut ham in bits; mash herbs and seasonings with it, and put them aside.

Boil turtle meat 15 minutes. Turn it off and save the stock. Chop up the meat.

Brown onions in lard; add turtle meat and let it brown well. Then add ham and seasonings, stirring constantly. Then add flour, stirring constantly.

Add stock and 2½ to 3 quarts of water with salt and various peppers and also the lemon chopped very fine. Put in a double boiler for an hour or so, stirring at frequent intervals.

Bottomland Print Offered

Proceeds from the sale of these prints will be placed in the Nongame and Endangered Wildlife Fund which supports a variety of nongame wildlife projects and the purchase of wildlife habitat in North Carolina. Each poster-sized, numbered print bears the North Carolina State seal, Governor Martin's signature, and the artist's signature.

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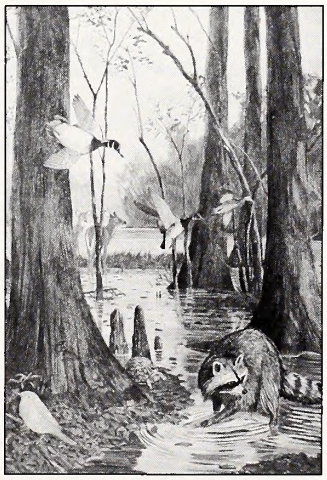

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Addresses Needed For Record Holders

Information Sought On North Carolina's Record Fish

Last year was apparently a good time for anglers to try their luck in North Carolina. New records were set during 1987 for spotted bass, striper-white bass hybrids, flathead catfish, muskellunge and white perch.

In fact, the entire 1980s has been a great time to bag a lunker as the records show (current through February 1988). Of the 35 freshwater gamefish species for which records are kept, new records have been established for 17 of them since the beginning of the decade. The two oldest records still standing are for a 14-pound, 1-ounce rainbow trout caught in 1949, and for a 10-pound, 2-ounce smallmouth bass caught in 1953.

One problem remains, however. The N.C. Wildlife Resources Commission, which now maintains these records, does not have current addresses for many of the anglers who have caught record fish. As part of this program, the Division of Boating and Inland Fisheries is sending out certificates to each record holder. If you're listed as one of the record holders below — or you know one of these record holders — please drop us a note so a certificate can be sent. Send your information to: Division of Boating and Inland Fisheries, N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27611. You can also write this address if you wish to know how to go about applying for a record.

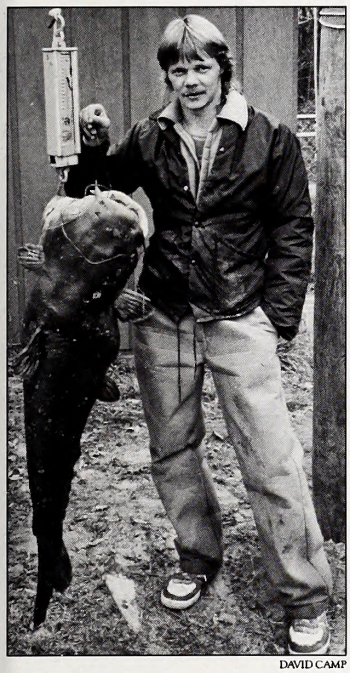
North Carolina Fresh Water Sport Fishing Records

species	weight of catch	location of catch	date of catch	name of angler	lure or bait
bass, largemouth	14/15	Santeetlah Reservoir	4/26/63	*Leonard Williams	L & S Bassmaster
bass, rock (redeye)	1/4	Nathans Cr., S. Fork New	5/19/84	*Gary D. Hess	artificial crawdad
bass, smallmouth	10/2	Hiwassee Reservoir	6/ /53	*Archie Lampkin	
bass, spotted	4/4	W. Kerr Scott Reservoir	4/11/87	Mike Bumgarner	Strike King spinner bait
bass, st. x white bass	17/05	Falls Lake (Stanley Co.)	3/12/87	Cramer Kilpatrick, Jr.	Bomber
bass, white	5/14	Kerr Reservoir	3/15/86	Jim King	bucktail
bass, Roanoke	2/8	Hope Mills Lake	9/08/78	*Freddy H. Casten	6" Creme Worm
bass, striped	39/4	Hickory Lake	5/10/69	*Bill Dulla	
bluegill	4/5	Henderson County	7/27/67	*Danny Case	Catawba worm
bowfin	17/3	Wylie Reservoir	2/01/76	*Dickie Helms	live minnow
bream, flyer	1/00	private pond	4/01/82	*William Stocks	Beetle Spin
buffalofish	45/2	Badin Lake	6/08/74	Max E. Lowder	Big B
carp	48/00	Mecklenburg Co. pond	3/11/86	*William Houston, Jr.	
catfish, blue	69/04	Badin Lake	2/08/88	*Randy Marion	shad
catfish, channel	40/8	Fontana Reservoir	4/15/71	*P.P. Paine	
catfish, flathead	62/07	Yadkin River	6/11/87	Royce Flippin	live shad
catfish, white	6/11	Mecklenburg Co. pond	5/01/81	*John S. Carter	cut bait
crappie	4/15	Asheboro City Lake #4	4/27/80	*Dean Dixon	minnow
muskellunge	34/0	Lake Adger	4/08/87	Charles Henlsey	rubber worm
muskellunge, tiger	31/12	James Lake	8/27/86	Chris J. Robinson	spinnerbait
perch, yellow	2/3	Jones Lake, Bladen Co.	6/10/76	*Edge Hendrix	broke back Mirror lure
perch, white	1/14	Lake Gaston	3/29/87	Robert Miller	Speed Shad
pickerel, chain	8/00	Gaston Reservoir	2/13/68	John H. Leonard	
pickerel, redfin	1/9	Suggs Mill Pond, Bladen Co.	6/10/70	*Allen Lucas	
pike, northern	11/13	James Lake	8/26/78	*Keith Gilliam	Storm Wiggle Wart
sauger	5/15	Norman Lake	7/25/71	*David Shook	topwater Rapala
shad, hickory	2/13	Pitchkettle Creek	2/17/74	*John W. Moore	
shad, American	7/15.5	Tar River	4/10/74	*R.S. Proctor	
shellcracker	4/4	Lee County pond	2/03/68	Bill Arnold	worm
sunfish, redbreast	1/12	Bladen Co. Big Swamp	5/29/83	Ronald Stanley	beetlespin
trout, brook	7/7	Raven Fork River	5/15/80	*G.L. Marshall, Jr.	rooster tail
trout, brown	15/7	Tuckaseigee River	5/15/82	*Lantford E. Cox, Jr.	Rapala
trout, rainbow	14/1	Glenville Lake	3/06/49	Max Q. Rogers	
walleye	13/8	Lake Chatuge (Shooting Cr.)	8/16/86	Lamar L. Cofer	Old Faithful Spoon
warmouth	1/13	Richmond Co. McLeods Pond	5/07/76	*Emma Sears	

*current address of record-holder requested

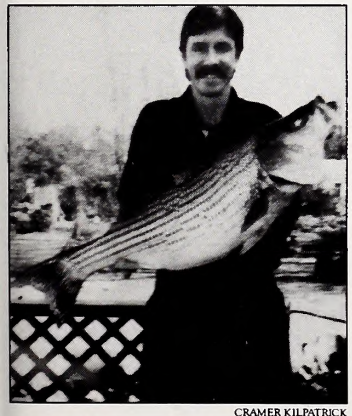
Recent Records

Two Keepers



DAVID CAMP

A Scale Stretcher: *Randy Marion of Seagrove astounded anglers when he caught the new state record blue catfish, a 69-lb., 4-oz. whopper from Badin Lake. The fish may be the largest caught in fresh water in North Carolina in this century.*



CRAMER KILPATRICK

Big Fish: *Cramer Kilpatrick of Concord enjoys fishing for large hybrid stripers in Piedmont reservoirs, and caught his 17-lb., 5-oz. record fish from Falls Lake in Stanly County. He had held the state record for hybrid stripers once before.*

Unique Defense Goes For Naught

Squirrel Dogs Fly In Swain County Court

It'll be a cold day somewhere when pigs fly, but dogs flew not long ago in Swain County. At least that was the unique defense offered in a squirrel-hunting case. The story was related by Sgt. Travis Whitson, a wildlife enforcement officer from Bryson City.

One day last fall, an officer with the Nantahala National Forest saw a man carrying a .22 rifle slip into the woods. The squirrel season was closed, and the officer decided to follow him. The hunter stalked quietly through the woods, unaware that he was being observed. A gray squirrel scampered through the oaks just ahead of the hunter. The man periodically aimed his rifle up into the treetops, but was unable to get a shot. The officer felt he had seen enough, and wrote the man a citation for hunting squirrels out of season.

The man decided to plead his case in court. He told the judge that a neighbor's dog had been killing his chickens. On the day in question, he'd seen the murdering cur sneak into the woods with one of his hens and had followed, intent on taking care of the problem once and for all.

"But what about the squirrel the officer said you were hunting," inquired the judge.

"I'd say he was just passing through, your honor," the man quickly replied. "There usually ain't no squirrels in those woods."

"I'd be inclined to believe your story if it wasn't for one thing," said the judge, visibly amused. "The officer said that you were aiming up into the treetops. Unless you can convince me that that dog could fly, I'll have to find you guilty."

"Well, your honor," the man said sheepishly, "I didn't actually see the dog get up in the trees, but I couldn't rightly say he didn't."

The judge smiled before pronouncing the verdict.

"Guilty, pay the clerk."

— Jay Davies

Crappies Ruin Farm Ponds

If you're building a farm pond, don't stock crappie. That's one of the quickest ways to send a good pond downhill, according to fisheries biologists with the N.C. Wildlife Resources Commission.

Crappie are often added to ponds, and the result is usually unbalanced fish populations. Crappie quickly overpopulate ponds, resulting in lots of small fish. They also compete with bass for limited food.

The best species to stock are bass, bluegill and channel catfish. Redear sunfish or shellcracker, however, can be substituted for part of the recommended bluegill stocking.

The Wildlife Endowment Fund Report

The Wildlife Endowment Fund is supported by the sale of lifetime licenses, lifetime subscriptions to *Wildlife in North Carolina*, and tax-deductible contributions. Only the annual interest from this fund is used for wildlife conservation, and the fund will play a key role in supporting wildlife programs in the future. Interest is earned through investments made by the State Treasurer's Office. For more information, write to the Wildlife Endowment Fund, N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27611.

Status on April 30, 1988

	Numbers Sold	Revenue Received
Lifetime Sportsman's License	44,403	$14,323,986.69
Lifetime Hunting License	311	75,080.48
Lifetime Fishing License	3,358	631,778.09
Lifetime Subscriptions to Wildlife in N.C.	1,324	169,892.92
Contributions	—	111,111.88
Total Revenue Received		$15,311,850.06
Total Interest Earned	$2,846,757.17	

Calendar Of Events

July 1-3
Annual Croaker Festival at Oriental. Fishing, sailing, arts and crafts and other events.

July 1-4
Southeast Old Thresher's Reunion at Denton. Large display of steam and other antique farm machinery.

July 3-4
Festival for the Eno at West Point on the Eno Park in Durham. Traditional music, dance and crafts. Sponsored by the Eno River Association, proceeds help buy additional parklands along the river.

July 11-15
Captain Fannie's Billfish Tournament at Atlantic Beach. For more information contact Anchorage Marina, P.O. Box 7, Atlantic Beach, N.C. 28512.

July 20-24
Macon County Gemboree at the Macon County Community Building in Franklin. Displays and lectures on North Carolina gems and minerals.

July 31
Curing Barn Party at the Duke Homestead State Historic Site in Durham. Demonstrations of traditional methods of curing tobacco.

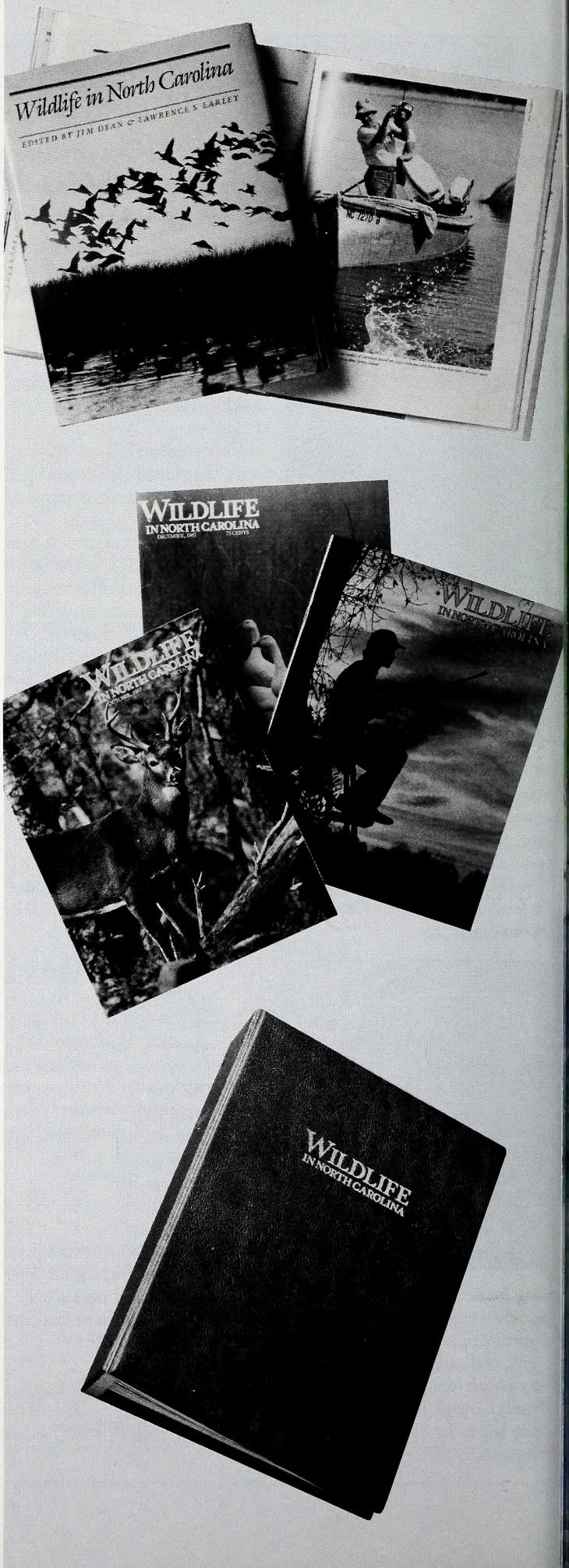
Everyone's talking about *Wildlife in North Carolina*... the book!

"This attractive book is probably intended for the sports or outdoors person; but in fact it should appeal to anyone with an active interest in our state's history, natural or otherwise."
— Michael McFee, *The Spectator*

"This book . . . is a fitting commemoration of the magazine's 50th anniversary. The book's four sections reflect the emphases seen each month, as the magazine seeks to interest nature lovers and environmentalists as well as the serious hunters and fishermen . . . ."
— Linda Brinson, Winston-Salem *Journal*

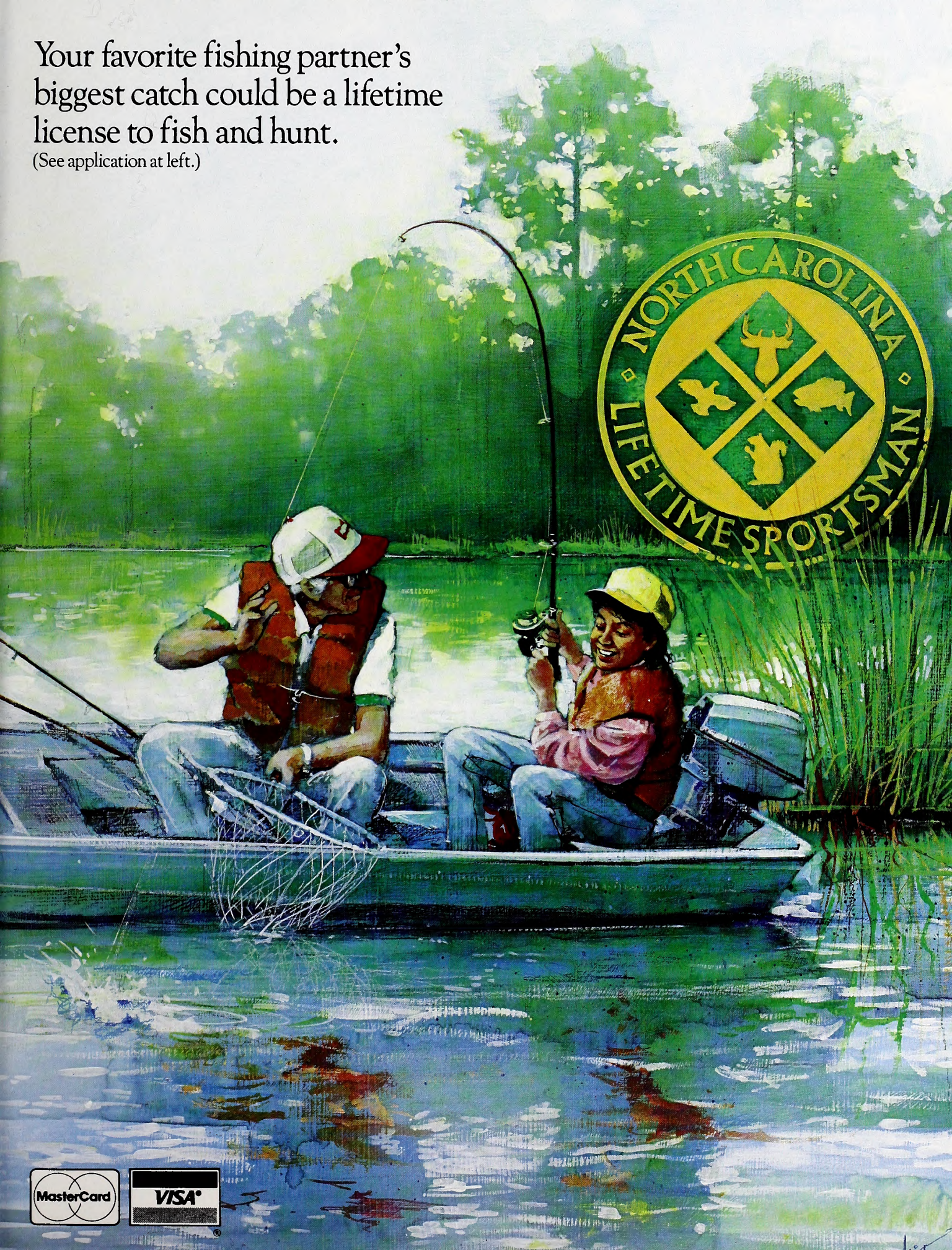
"It is not only for the sportsman in the family but for all the family and an excellent book to send both to Tar Heels who have moved away and to folks who have just moved into North Carolina . . . . The only fault I find with *Wildlife in North Carolina* is that it is not long enough."
— Buggs Barringer, Raleigh *News and Observer*

Published by the N.C. Wildlife Resources Commission and the University of North Carolina Press. Hardbound copy is $24.95 at your local bookstores.
Or order direct using the special order form on the opposite page.



Your favorite fishing partner's biggest catch could be a lifetime license to fish and hunt.

(See application at left.)



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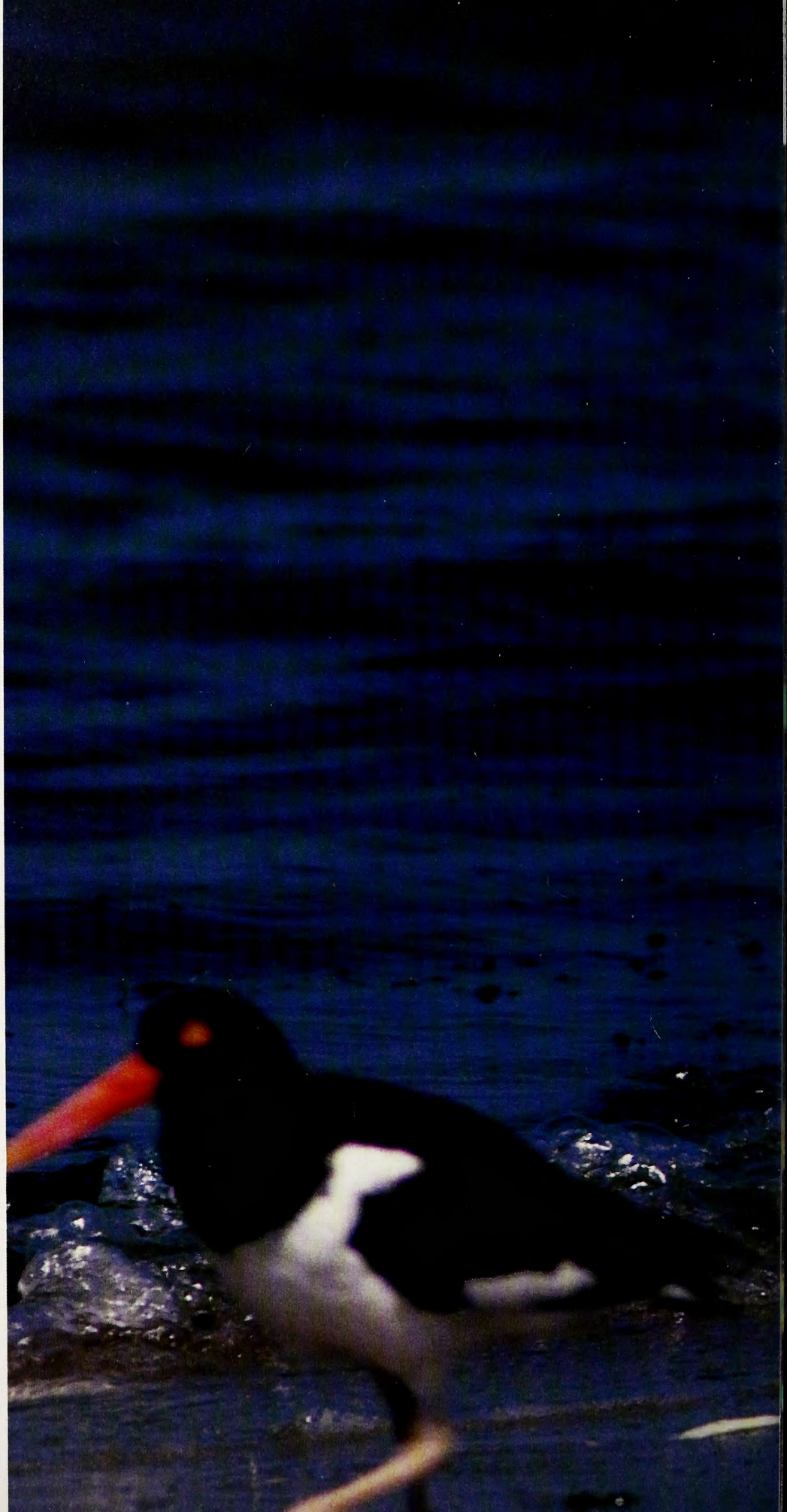

Beachcombers

This colorful pair of oyster catchers wades the edge of the inlet at Hammocks Beach looking for tasty morsels of seafood. These shorebirds are among many that find the state park's undeveloped beaches to their liking.

LITHOGRAPHY BY EDWARDS & BROUGHTON COMPANY, RALEIGH, NORTH CAROLINA

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WILDLIFE IN NORTH CAROLINA

AUGUST, 1988 75 CENTS

One Fisherman, One Boat

by Jim Dean

There is no such thing as the perfect all-round fishing boat. A serious fisherman could easily use half a dozen, especially if he fishes in both fresh and salt water. Unfortunately, any angler who attempts to acquire such a fleet is likely to catch more grief than fish. No doubt you've heard that a boat is merely a hole in the water into which you pour money.

There are, however, some possible compromises you may want to consider. I suspect the dilemma may be greatest for the salt water angler whose needs may range from a marsh-fishing skiff to a 50-foot sportfisherman. Some coastal anglers compromise by buying a 17- to 23-foot, center-console open boat (Boston Whaler, McKee, Robalo, Mako or something similar) powered by one or two big outboards. Such a boat can handle most inshore fishing in our big sounds and around inlets, and even make day trips offshore in good weather. The disadvantage is that it may cost $20,000 or much more, and it's still not ideal for all saltwater fishing, and even more limited in fresh water.

JIM DEAN

There's a further compromise you might consider, especially since it can also serve double duty in both salt and fresh water. There are smaller boats — 15 to 18 feet — that follow the hull lines and basic style of the big open, center-console outboards. Like their larger cousins, they are wide and stable with relatively flat, self-bailing decks free of clutter. Some have deep or modified "V" hulls that are faster and more comfortable in rough water, while some have sled or modified tri-hulls that draw less water, yet are still safe. These smaller boats should, of course, be fast enough to let you run for cover when weather threatens.

New boats that fit this description are more affordable than the big boats, but you shouldn't overlook the used-boat market. Used boats are even more reasonable because so many people buy them new, use them a dozen times, then sell them for less than half what they paid. A word of caution may be worthwhile. It's a good idea to let an expert check a used boat before you plunk down any cash. Also, for saltwater use, avoid any boat with an enclosed seating compartment in front of a windshield near the bow. These "holes" can collect a breaking wave and swamp you.

The bonus, of course, is the potential such a boat also has for use in fresh water on big lakes and rivers. A first-rate, fully equipped freshwater bass boat with pedestal seats and a foot-controlled electric motor is more comfortable, but it may cost $15,000 or more. However, an enterprising angler can equip his basic center-console saltwater boat with removable pedestal seats and a trolling motor, and have a boat that —while not ideal — can be used both in salt and freshwater. Indeed, some boat builders seem to be offering more models equipped just this way.

You may still need a boat you can use on ponds, small rivers or small lakes that don't have good ramps, but there's a simple and relatively inexpensive solution. A properly outfitted aluminum johnboat comes closer than anything else to being the most ideal all-round boat for use on inland waters. It's perfect for farm ponds, larger millponds and municipal lakes, and nearly ideal for our meandering blackwater rivers. It's roomy, stable, portable, and safe when properly used.

An ideal rig might consist of a 12- or 13-foot aluminum johnboat with a 5- to 7½-horsepower gas outboard (a 9½ may be okay for wider 13 footers). By all means, add an electric trolling motor (17- to 28-pound thrust is plenty unless you fish fairly large lakes that prohibit gas outboards), and get a deep-cycle marine battery. Some foot-controlled electric motors will also fit small boats if you want the ultimate, and you can even add seats for improved comfort.

Mounted on a small galvanized trailer, such a rig can be trailered behind compact cars, and loaded or unloaded almost anywhere by one man. Without a trailer, it can still be cartopped, or loaded in the back of a pickup. Best of all, the boat, two motors, trailer, and battery should run only about $2,000 even bought new. Half that cost is for the gas outboard that you might not need.

A johnboat as short as 10 feet isn't recommended unless you plan to fish alone solely on farm ponds. A 12 footer makes a better two-man boat capable of being used more safely on small lakes and rivers. A 14 footer — especially with a semi-V bottom — would be even safer on larger water, but you're pushing the limits of a boat you can use in ponds, or launch alone from a cartop or pickup.

True, a small johnboat isn't ideal or even safe crossing rough, open water on large impoundments, but you can certainly use such a rig on big lakes if you stick to smaller coves, avoid rough water and watch the weather. Indeed, because it's adaptable to so many types of water, you may actually catch more fish out of it than any other boat. Maybe one fisherman, one boat is too much to hope for, but two boats? It's possible.

August, 1988
Volume 52, Number 8

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WILDLIFE IN NORTH CAROLINA

Wildlife in North Carolina is the official educational publication of the North Carolina Wildlife Resources Commission, and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources and the environment we share with them.

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Back Of The Book *by Mark Taylor*

Cover *An eastern box turtle takes a cooling dip in a puddle. Photograph by Ken Taylor.*

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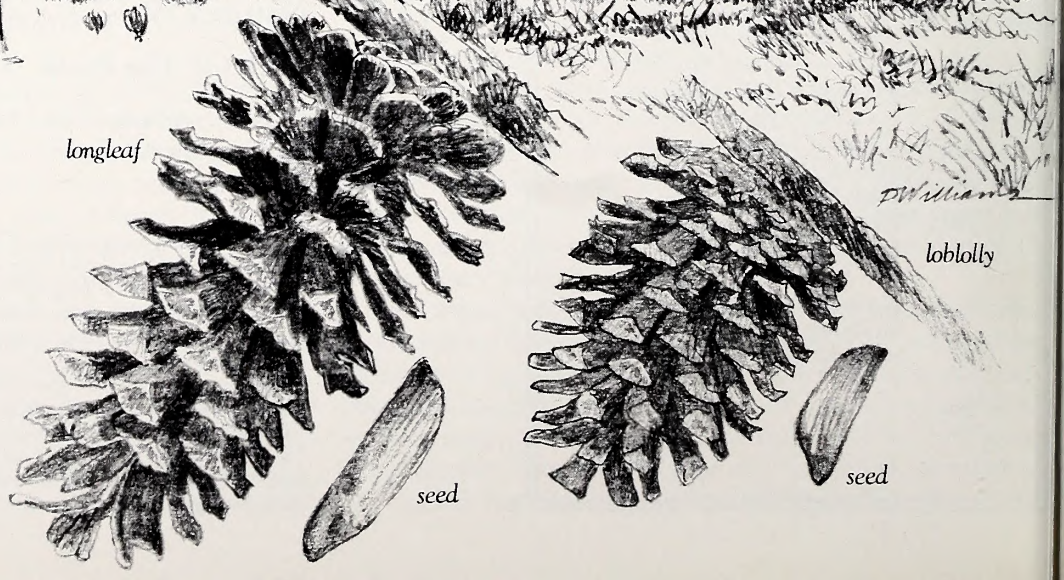
***Loblolly is a** perfect pioneer because it produces lots of seed more frequently than longleaf. Its smaller, lighter seeds are blown farther than the larger, heavier longleaf seed. Despite these advantages, loblolly was a minor player in the original southeastern piney woods because it could not tolerate fire.*



Temporary Arrangements

written by Lawrence S. Earley / illustrated by David Williams

Unlike bettors, nature plays no favorites. What we often regard as the status quo — the communities of plants and animals in a certain location — is really only a temporary arrangement. Introduce a new element or take something else away and you may change that arrangement, no matter how long it has persisted. One can only think of the dinosaurs which flourished for nearly 150 million years before disappearing in a still mysterious event during the Cretaceous period.

Consider another temporary arrangement, the longleaf pine forest which for thousands of years dominated the southeastern Coastal Plain from Virginia to Texas, and then in less than 200 years passed its scepter to the loblolly and the slash pines.

All things being equal, perhaps the loblolly pine should have originally inherited the Coastal Plain. If you compare the seeding mechanisms of longleaf and loblolly, the advantage seems clearly loblolly's. Longleaf produces cones of enormous size — 6 to 10 inches long — with very large seed. So heavy are these seeds, that an average-sized tree cannot disperse them very far at all. And the tree doesn't produce seed every year — a decent mast occurs once every five to seven years. Moreover, the seed possesses such energy value that it is eagerly sought by many wildlife species, including fox squirrel, deer, wood ducks and even quail.

Loblolly, on the other hand, produces a very small, light seed easily dispersed by the wind over long distances. The tree produces seed almost annually, and it is a prolific seed producer as well.

Yet it was the longleaf pine that dominated the forests of the Southeast, and it was loblolly that huddled in the "humble" habitats of wet creek bottoms.

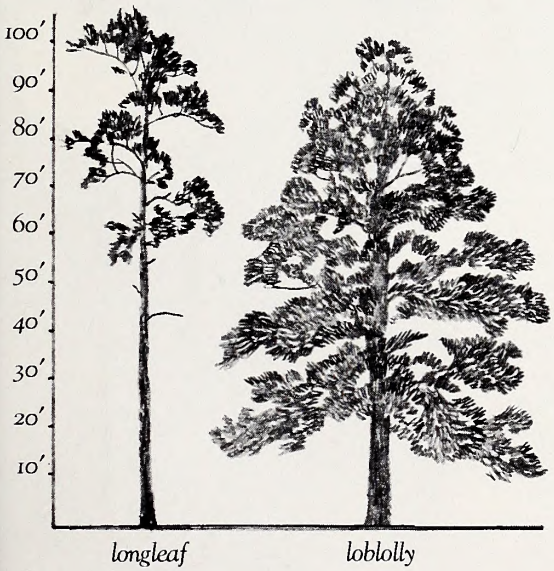
The main reason was fire. Practically alone among conifers of the region, longleaf pine evolved resistances to the lightning-ignited fires that frequently swept across the Coastal Plain. For the first several years of its life, for example, the tree remains in a low, bushy "grass stage" in which the terminal bud is protected from fire by a dense growth of needles. During the next few years, the tree quickly shoots up 3 feet a year thus lifting the terminal bud above most surface fires. It also develops an armored layer of thick, scaly bark which resists all but very hot fires. Loblolly, on the other hand, lacked these resistances and thus was restricted to the wet areas.

European settlers created ripples in this arrangement. They introduced swine which foraged freely through the forest and fattened on the highly caloric longleaf seeds, further diminishing the number that could germinate. They felled the forests, disturbed the soils, and, more important, controlled and even suppressed fires.

With fewer fires, the advantage shifted to loblolly's light, prolific and frequent seed. Since it was no longer burned up by fire every two to three years, loblolly began to move out of the wetter areas and invade the drier longleaf habitats. Without fire to contend with, it grew quickly in the disturbed soils. Under the new regime, longleaf's infrequent mast production and heavy cone worked to its disadvantage as the loblolly shaded out its slower-growing longleaf kin.

Twentieth-century timber companies liked loblolly and encouraged its growth, but by that time, the replacement of longleaf by loblolly had already begun as a natural repercussion of human intervention.

***In the competition** between longleaf pine and loblolly pine, longleaf had the edge because it adapted to the frequent fires that swept through the Southeast. In the illustration, the young longleaf sapling in the foreground has been singed but not destroyed by a fast-moving surface fire. Below, three small seedlings have lost nearly all their needles but their growing tips have survived the fire.*



***Longleaf and loblolly** pines can grow nearly the same size, but their growing characteristics are very different. The slower-growing longleaf labors in its youth, whereas loblolly spurts. In seven years, the longleaf may still look like a clump of grass while the loblolly may be 15 feet tall. In 25 years, longleaf may be 45 feet tall, loblolly 70. In 70 years, longleaf is 70 feet tall, loblolly 90. In 150 years, the mature longleaf may be 110 or 120 feet high, slightly outgrowing the loblolly pine.*

SURFACE *In The* SALT

Not many anglers use topwater lures for salt-water fish, but it's a tactic that's both effective and exciting.

written and photographed by Joel Arrington

Every fisherman, it is probably safe to say, would prefer to catch all his fish on the surface. Ideally, he wants to see his quarry in advance and to cast an artificial lure with surface action; he wants to see the violent moment at which the fish is deceived and strikes the lure. An angler will settle for not seeing the fish first, but he wants to cast to a place where a worthy fish, out of the angler's experience and hunch, is thought likely to be. The instant of explosive contact between the fish and the lure — wished for, anticipated, caused and observed by the fisherman — is the total justification of angling for many of us.

An objective survey would reveal, however, that only a fraction of salt water species are taken on topwater lures, perhaps less than 20 percent.

The reasons are clear. Subsurface methods produce better day in and day out because fish are not at or cannot be lured to the surface most of the time. Resigned to this unhappy fact, many salt water anglers fish deep

***Floating lures will** catch a wide variety of salt water fish if you know when and where to use them. This giant bluefish (left) was caught on a flyrod and big popping bug, while the dolphin (right) took a surface popper fished on spinning tackle beside a weed line in the Gulf Stream.*

***Dolphin can often** be coaxed into striking noisy poppers on the surface especially along weed lines. School dolphin average 3- to 5-pounds, though some bigger ones may be caught, and these fish are great sport on light tackle.*

out of habit and resistance to change. The truth is, more often than not, they could be catching fish at the surface and having more fun. It's only a matter of technique and knowing when the time is ripe.

Topwater fishing in salt water is not much different from that in fresh water. Whereas lures for inland fishing tend to imitate a wide variety of food items — insects, frogs, mice, snakes, birds, ducklings, as well as baitfish — saltwater surface attractors imitate only fish or, rarely, squid or eels. Saltwater lures may be bigger — up to 4 ounces — but lures down to ¼ ounce are effective in the salt as well as in fresh water. Most saltwater lures for plug and spin tackle will weigh from ⅜ ounce to something over 3 ounces. Flies are a different story.

Lures for fly fishing are not referred to by weight, but by hook size, ranging from #6 to 5/0 for salt water. Even that does not give a precise indication of how they will cast. Sliders are designed to simply glide along the surface like a minnow. They have little hackle, sharp noses and are therefore streamlined and cast fairly well, though not as well as a streamer. Popping bugs, on the other hand, are designed to look like a mouthful to a fish and to be pulled under, submerging their faces, pushing water ahead and grabbing air. The result is a sharp sound and considerable disturbance. They are air resistant and therefore require a heavy fly line to cast them any distance.

Colors for saltwater plugs range over the spectrum. You will see some of everything because ideological warfare rages between those who favor attractors and those of the natural persuasion. Devotees of the natural school of thought believe the more nearly like a real minnow you make a lure look and move, the more likely it is to be mistaken by a predator. Thus, modern technology has produced plugs with scale patterns and colors so real you'd swear they could swim away.

Those anglers favoring attractors say a natural look is not only unnecessary, it is counter productive. A predator will swim around a school of bait all day and never attack, they argue, unless one minnow is different. It's the crippled or odd-sized bait that is attacked, so anglers should have a lure that is also different. After hundreds of years of fishing experience we have learned that some of the most unnatural looking artificial lures are highly successful in catching fish.

I think interest in natural bait finishes is waning because a lot of fishermen have tried them in the last few years and found them to be no better than traditional patterns. As such, they have gone back to tried and tested color schemes. Scale patterned lures do, of course, catch fish in generous quantity, but they do not have to be painted that way to do so.

Some anglers fish fluorescent orange plugs for big bluefish so they can see the strike. Bluefish don't care.

Basic topwater lure types are the chugger, the pencil popper and its variations, the

darter and the floating-diver. Examples of the chugger are the Arbogast Scudder (a floater), the Rebel Windcheater (a sinker), and the Gibbs Polaris Popper, which sinks, but slowly. In its large size, the Scudder is the best I have found for bringing fish up from depth over a wreck or piece of rough bottom. It floats, so it can be worked in place for long periods if your boat is not drifting too fast. It casts well enough for fishing from a boat, but not as well as the Windcheater or Polaris, which were designed with the surf in mind. The Windcheater will sink if you stop its retrieve, but is ineffective unless it is on the surface. The Polaris, however, sinks, but wobbles seductively beneath the surface until brought back up. Gibbs lures are of wood, cast extremely well, and are superbly crafted.

Pencil poppers are elongated surface lures that come in a number of variations. Some are heavier and thicker at the hook end, like the Gibbs Pencil Popper, so they cast well. These lures can be run fast on the surface, like a panicked needlefish. If you stop the retrieve, most models float vertically. Others sink. A variation is the "nodding" pencil popper, which is designed to float with its head out of the water. A skillful caster can nod it gently and seductively, then retrieve it with scattered pauses and jerks in a method called "walking the dog." The retrieve imitates a feeding or injured minnow and depends highly on fisherman skill for proper execution.

Another variation is the pencil popper with propellers on one or both ends, like the Smithwick Devil's Horse. On the retrieve, it produces a wet purring sound.

Darters float horizontally or tail down but pull under and swim with a slow wobble beneath the surface. Some have curved backs and can be pulled sharply under with a sweep of the rod, only to surface near the same spot. They can be fished with varying speeds and pauses. In the hands of an able caster, they can be among the most productive of topwater lures in shallow water, and the most satisfying to use.

Floating-diving plugs like Rebels and Rapalas, or Cotton Cordell's Redfins can be fished on the surface or beneath it. The larger the lip the deeper the lure is designed to run, but all except a few sinking models have positive buoyancy and will return to the surface if you stop the retrieve. In my experience, floating-divers work best as surface lures in water under 10 feet deep because they do not make sufficient disturbance over a wreck or artificial reef.

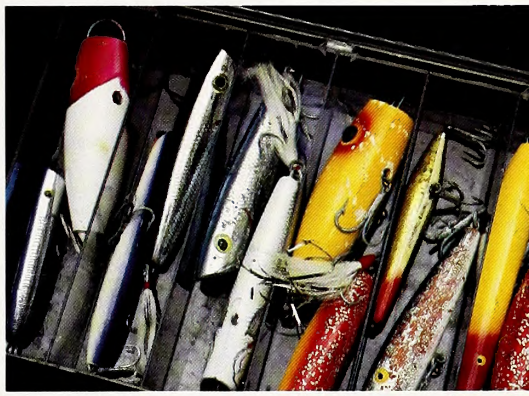
As a rule in fresh water, topwater plugs work best at dawn and dusk. That's not necessarily true in the salt. Fishing can be good at any time, but it is rare that it's good all day. I like to get to a wreck early, not because I expect the fishing to be good at dawn necessarily, but to get there before traffic. Once a school of amberjacks has been fished, they are much less likely to be worked up again.

Nocturnal fishing can be exciting for striped bass. On November nights 20 years ago, you could hear big fish taking mullet that washed out of creeks at Snow's Cut and Carolina Beach Inlet. We fished 52M11 MirrOlures, a sub-surface model, because that is what Dan Holt, my guide and advisor, said they would take. We held our rod tips high and reeled them just fast enough to keep them at or just under the surface. Usually strikes came at a distance so you couldn't see them in the dark. All the while other violent strikes were occurring nearby like someone dropping bricks off a bridge.

I suspect we could have done just as well, if not better, with a floater-diver. But a MirrOlure, with its straight, actionless retrieve, is very much like a mullet.

Those stripers were tough, and we only succeeded in catching a few of them over the years, but when the time is ripe for topwater, you can hardly miss. When snapper bluefish are actively chasing bait, for example, any small topwater lure of the approximate size of the bait cast near the surface disturbance is highly likely to be eaten. Once a fresh (not recently fished) school of amberjack is attracted to the surface over a wreck, any big, noisy topwater plug is going to get attention, if not smashed. Often jacks will follow a lure without striking, but if you chug the lure hard (being careful not to pull it out of the water and foul it over your line) you can entice a strike, especially if there is any other fish around that your target might perceive as a competitor for the lure.

The time can be right in an inlet rip. Birds working overhead may tip off where bait fish have gotten trapped and are being preyed on by unseen toothy critters below, but not necessarily. Just as in mountain trout fishing, where with experience you learn to read the stream, so in inlet fishing you develop a sense of where blues, Spanish or sea trout may lie on a given level of the tide.



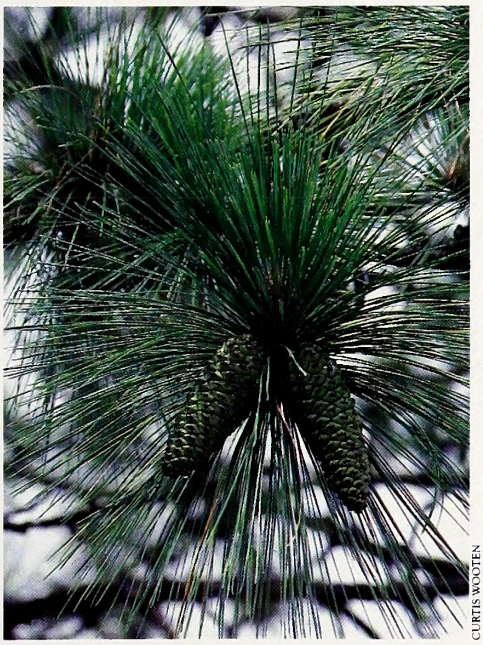
Catching salt water fish *on the surface is one of angling's ultimate thrills, and it pays to carry a selection of topwater lures in various sizes to take advantage of such opportunities. Blues, amberjack, dolphin, seatrout, mackerel and other species will eat surface lures when conditions are right.*

The outer bars on the ebb are often alive with bait, bluefish and Spanish mackerel in summer. Crevalle jack will sometimes smash a lure you've cast for bluefish. Inside Outer Banks inlets in April and May, big schools of jumbo bluefish may gather to feed in the shallows. A surf rod will let you lay far enough off the schools so that you don't spook them. Throw a pencil popper, run it fast and hold on.

Time of year is important, too. After the first northeaster of September, amberjack that have been lethargic all summer will suddenly become aggressive and eat everything you throw in the water. When bluefish take up residence on a wreck from October to December, water temperature there is going to be tolerable from the bottom up. Blues will therefore be cooperative and smash pencil poppers and chuggers — anything — with abandon.

For me and a lot of other anglers, most of the pleasure of fishing is seeing the strike. But, of course, for those who also enjoy what follows the strike on a topwater lure, the rest will be pleasantly familiar. ⊠

LAWRENCE S. EARLEY



CURTIS WOOTEN

Once, longleaf pine forests dominated eastern North Carolina with open meadows under massive trees where the wind whispered through long green needles. Today, only remnant stands of our official state tree are left.

Looking For Longleaf

by Lawrence S. Earley

Here's to the land of the long leaf pine,
The summer land where the sun doth shine,
Where the weak grow strong and the strong grow great,
Here's to "Down Home," the Old North State!
— from the State Toast, composed in 1904 by Leonora Martin and Mary Burke Kerr.

One

"First we have to work on the foresters, and then we can work on the private landowners."

Fred White's voice is barely audible above the clatter of the computer printer outside his office, a 10th-story aerie in the N.C. Forest Service headquarters near downtown Raleigh. He speaks softly, carefully, a diminutive man in his middle years, thinning hair graying slightly, a former Duke professor with a runner's metabolism and, deucedly, runner's heel spurs. His daughter has been urging him to take up biking.

Sunny aisles of *longleaf pines greeted the earliest travelers in the coastal plain from Virginia to east Texas. This recently burned old-growth stand in Georgia is one of the only "virgin" tracts left in the Southeast. Huge cones and long needles (above) identify longleaf.*

But now, as the Forest Service section chief for technical development and planning, White is invoking his "dream" — of seeing the woodlots of small landowners waving with longleaf pine rather than loblolly pine. There are still some rough edges to this dream, but he's working on them. He can see the shaking heads of the doubters, but he'll work on them, too. First the foresters, then the landowners.

It all makes so much sense. For almost 100 years, loblolly pine has been the tree of choice for the southern timber industry and private landowners. With good reason. The souped-up loblolly strains that have been developed sprint out of infancy like a basketball phenom, growing so big so fast that they can be harvested in 25 years or less. But this obsession with rapid growth and maximum volume production has a price. Call it sprinter's knees. The fast-grown, juvenile wood lacks the strength needed for good structural lumber. "Quite frankly, it's giving southern pine a relatively bad name in the construction business," White says. And for the landowner the costs of clear-cutting his "old" forest and planting a new one every 25 or 30 years are considerable.

Longleaf pine, by contrast, is a long-distance runner. Its rotation age is 60 or 70 years, twice the loblolly's, but the tree is eminently suited to the needs of the small landowner. Its wood is better quality than loblolly's and it's heavier, too, meaning that

Looking For Longleaf

longleaf will pay more than an equal volume of loblolly. Once the forest is established, moreover, the landowner can harvest it frequently over time — "light, partial cuts," says White — without the major costs associated with clear-cutting and regenerating a completely new forest. "The cost of practicing forestry would decline, the impact on the forest would decline, and the quality of the product would probably increase."

Of course — White shrugs — there are a few problems. Longleaf pine is hard to grow, he says. Landowners generally want a quick cut and their cash. The timber industry would resist.

"Three trivial problems," he says ironically.

The printer clatters. White stirs in his chair. There's something else on his mind, something he may never live to see, but it's a pleasurable thought. "There's a beautiful poetry about restoring longleaf to its former range," he says. "That would please me tremendously."

Two

North Carolina didn't go from being the "land of the longleaf pine" to the land of the loblolly all at once. It took nearly two centuries of plundering before the land could be so transformed. Today, fragments of the state's once-vast longleaf forest are scattered throughout national forests, state parks and wildlife gamelands. Too often, however, these remnants bear as little resemblance to the original as a match flame to a forest fire.

Actually, North Carolina wasn't the only land of the longleaf pine. The stanza above could just as well have referred to South Carolina, or Georgia, or Florida or Alabama or Mississippi, so widespread was the longleaf forest throughout the Southeast. It was perfectly possible to travel the Coastal Plain from Norfolk, Virginia, to east Texas and except for crossing river swamps and creek bottoms never be outside of a longleaf pine forest. You could no more get away from it than you could avoid heat or chiggers or ticks. It was the dominant landscape form, as much as 70 million acres of it, the most extensive single-species forest in the country.

To catch a flavor of the original landscape today you have to travel through south Georgia and northern Florida where quail-hunting plantations monopolize tens of thousands of acres of second-growth longleaf. Or you can see it through the eyes of those who saw it first, the early travelers in the Southeast, the inhabitants of the piney woods.

William Bartram, the young Pennsylvania botanist who traveled throughout the Southeast for four years in the 1780s, left an engaging description of longleaf pine forests in his *Travels Through North and South Carolina* etc. (1791). One of his longest journeys took him on horseback from Florida's Atlantic coast across the Panhandle to the Mississippi River and back, passing through longleaf pine most of the way. He was clearly delighted by the open and sunswept country.

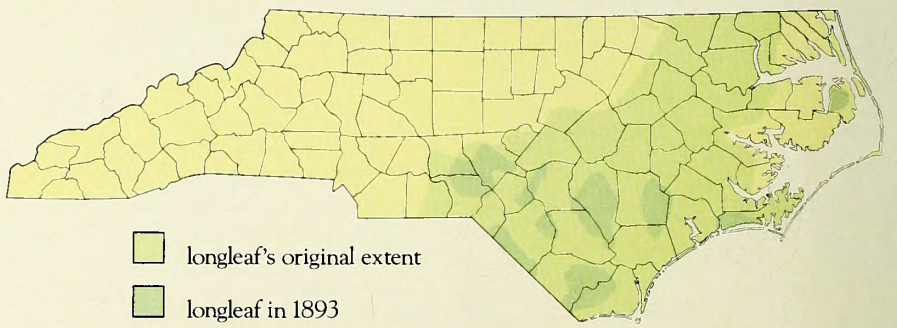
"We find ourselves on the entrance of a vast plain," he writes typically, "which extends west sixty or seventy miles . . . .This plain is mostly a forest of the great long-leaved pine *(P. palustris Linn.)*, the earth covered with grass, interspersed with an infinite variety of herbaceous plants, and embellished with extensive savannas, always green, sparkling with ponds of water . . . ." On another day, he and his companions ride for four or five miles over a "perfectly level plain, which appeared before and on each side of us as a charming green meadow, thinly planted with low spreading Pine trees." So sunny and open were the forests that the comparison to parks and meadows occurs often in his writing.

Other travelers celebrated the beauty of the tree itself, its great size and form. Everything about the virgin longleaf pine seemed oversized. The tree grew as much as 120 feet tall with a straight and slender trunk, and it bore enormous cones 6 - 10 inches long. Its needles were long and graceful and glinted in the sun. The high branches caught the breezes and amplified them into a distant but soothing murmurous sound.

Still other travelers, perhaps less aesthetically minded, complained of the monotonous effect of a landscape dominated, mile after mile, by a single species. One visitor recorded her first impressions of North Carolina as "a dreary Waste of white barren sand, and melancholy, nodding pines." Another described the country between Washington and Edenton as "primitive and lonely." The pines offered no variety, only the same "interminable perspective."

It's difficult to reconstruct the exact dimensions of North Carolina's portion of this forest. Rough estimates make it second to Georgia among the southeastern states in its extent. The forest grew principally in the Coastal Plain, although it pushed into the Piedmont uplands as well. According to the French botanist and traveler Francois Michaux in 1817, if you had struck out for the coast from Raleigh, almost immediately you would have been in longleaf pine forests. Even today, there are evidences of longleaf's Piedmont advance: an ancient stump in a Wendell hardwood forest; a few boxed trees around Raleigh's Yates Pond;

Land Of The Longleaf Pine



An estimated 10 million acres of longleaf pine cloaked eastern North Carolina when Europeans first arrived on the continent.

But by 1893, according to surveys by foresters W.W. Ashe and Gifford Pinchot, the virgin forests had nearly disappeared in North Carolina. Pinchot and Ashe warned that North Carolina's longleaf could not long survive the onslaught of turpentiners and loggers who swarmed throughout the longleaf belt. They were right. Indeed, by the mid-1920s, almost all the longleaf had been felled throughout the South in a free-for-all that despoiled the region of its natural patrimony.

In North Carolina today, second-growth longleaf hangs on in isolated pockets in national forests and other public lands. But its day as the dominant tree type in the eastern part of the state is over.

Map sources:
Elbert L. Little Jr., *Atlas of United States Trees* (1971).
Gifford Pinchot and W.W. Ashe, *Timber Trees and Forests of North Carolina* (1897).

LAWRENCE S. EARLEY

Grassy longleaf savannas, *such as this one in the Croatan National Forest, grew commonly throughout eastern North Carolina. Though almost all the original longleaf forests have been cut, second-growth forests like this one show the openness of virgin stands.*

N.C. WILDLIFE RESOURCES COMMISSION

The open canopy *of the longleaf forest favored the red-cockaded woodpecker, an endangered species today because of the lack of old-growth pine trees needed for nesting cavities. Quail, deer, wood ducks and fox squirrels thrive on the highly caloric longleaf seeds.*

longleaf trees growing in the Uwharries.

The pine's westward boundaries seem to have been Halifax, Nash, Wake, Moore and Richmond counties, with some longleaf in the eastern parts of Montgomery and Anson counties. In 1893, surveying the state's forested lands, Gifford Pinchot and W.W. Ashe surmised that in the Coastal Plain north of the Neuse River, longleaf had clung originally to discontinuous sandy ridges. From the Neuse south, however, longleaf was unbroken west to the Piedmont and south to the Gulf of Mexico.

Although longleaf was spectacularly adapted to the dry, sandy, near-desert conditions of the Sandhills, it also flourished on the wetter slopes and even pushed into the wet pocosins. Today, in the Croatan National Forest or the Green Swamp, you can see longleaf trees towering over pitcher plants, a wetland species. While loblolly was confined by the frequent fires to the wet creek bottoms and swamps, its true habitat, longleaf held sway over a vast area of the state.

The mature, old-growth longleaf pine that the settlers found made an excellent all-purpose timber. The tall, straight trunks made superb masts for sailing ships and structural timbers that were rot- and bug-resistant and, for their weight, as strong as steel. Four-fifths of the houses in the Carolinas, Georgia and Florida were made of longleaf or "yellow pine," as Michaux called it. He noted that longleaf boards exported to England sold for 25 to 30 percent higher than other pines from the United States. Later in the century, as industrial America began to flex its muscles, it was longleaf pine that provided joists for the new factories and timber for bridges, warehouses, railroad cars and wharves.

But longleaf was valuable for another reason. It was heavily saturated with a gummy resin which was the raw material for the mak-

Looking For Longleaf

ing of tar, pitch, spirits of turpentine and rosin — naval stores. In the 18th century, settlers made tar by burning dead branches of longleaf in a slow fire. Boiled tar yielded pitch. The two products were invaluable in the maritime trades. Boatwrights smeared pitch over the hulls of wooden boats to make them watertight and to discourage ship worms, and they caulked the floor boards with it. Sailors coated the standing rigging of sailing ships with tar to protect it from the corrosive salt air. Farmers used tar to grease wagon axles, to keep insects from climbing fruit trees. Medicines were devised from it. Dirt roads were covered with it.

Later, new uses were found for the resin tapped from the living tree. Distilled into spirits of turpentine, it was burned in lamps as an illuminant. Painters thinned their paints with turpentine and mothers coated their children's cuts with it. Farmers made medicines for their domestic animals out of it. Rosin, the residue of the turpentine distillation process, was used in soap making, weatherproofing, in shoe polish and medicines. Baseball pitchers used rosin and so did ballerinas. Rosin became even more important than turpentine.

By the middle of the 19th century, there were hundreds of turpentine stills in North Carolina's piney woods and they accounted for a large majority of United States naval stores production. Seventy percent of the nation's naval stores originated here in 1860. North Carolinians began to be called "Tar Heels," evidence of the importance of naval stores to the state.

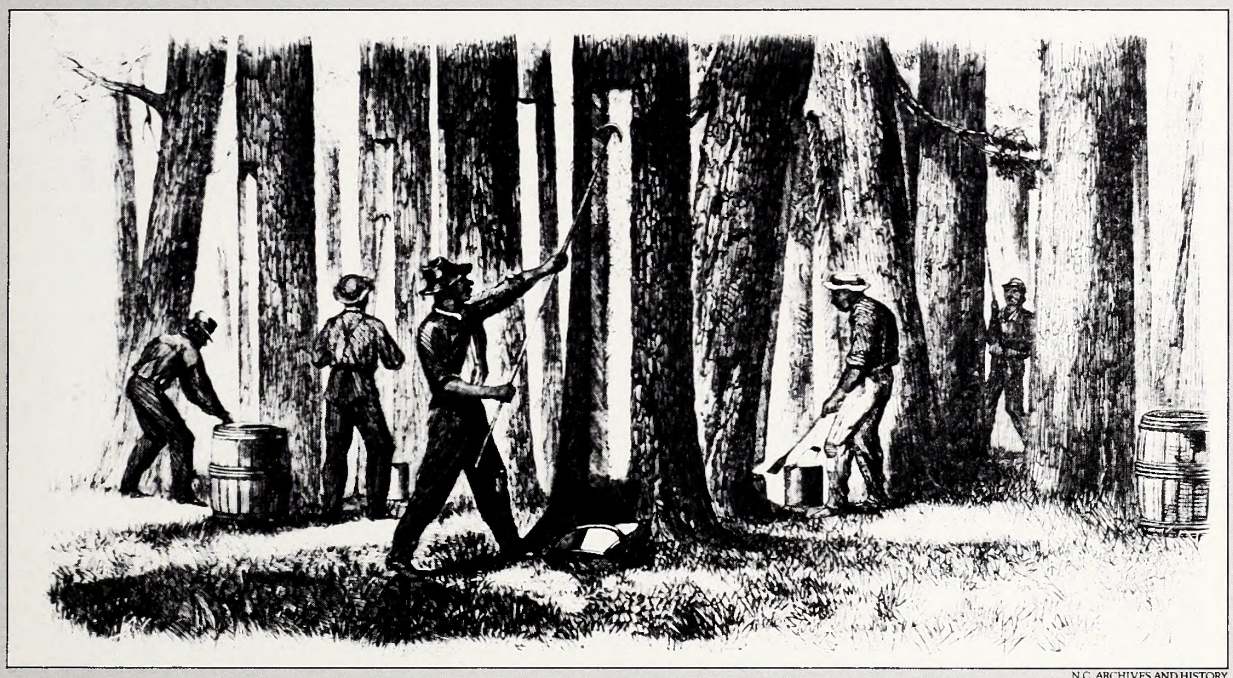
You couldn't go anywhere in the piney woods of 150 years ago without running into naval stores activity. It was as pervasive as tobacco culture is to our own day. In the deep pine forests, roads curled past trees scarred white with turpentine streaks. In winter, slaves cut boxes in the living tree to hold the resinous gum. In spring and summer, they hacked resin channels in the trees and dipped the gum from the boxes to barrels and trundled them to the stills in ox-drawn carts. At the turpentine distilleries, workers rolled barrels of resin to the vats while coppers hammered barrel staves together to hold the finished spirits. On rivers and streams the shouts and chants of rafters filled the woods as they floated yellow pine logs or barrels of turpentine to the ports. In Wilmington, the major port of the day, money men bought and sold the products of the inland forests. Sailing ships from around the world linked the piney woods settlements with Paris, London, Antwerp and other international ports where naval stores were bought and sold once more.

LAWRENCE S. EARLEY

***A cluster of** baby longleaf grows in an opening on the Sandhills Game Land. Behind the young trees and beneath the taller longleaf rises a thick understory of scrub oaks. Once fire-controlled, these oaks spring up in dense thickets if fire is prevented.*

But the demand for naval stores and the wealth that they created for turpentiners brought increased stress to the longleaf forests. In the years after the Civil War, railroads penetrated farther into the woods than ever before, and the pace of turpentining quickened. By the 1870s, Tar Heel turpentiners were hopscotching down to Georgia and Alabama, wherever virgin land was cheap and available. Fresh from annihilating the forests of the Northeast, the timber cutters followed, leveling the exhausted turpentine trees as they went.

Predictions of the demise of the longleaf forest in North Carolina were occurring long before the last virgin stands were toppled. By mid-century, travelers were reporting on the destruction caused by wasteful turpentine operations. Multiple boxes which workers hacked into the living tree killed many trees and opened others up to the ravages of insect infestation. Leaving the flammable resin coating over thousands of trees was like painting the forest with gasoline, elevating what ordinarily would have been a low-intensity surface fire into a conflagration. In 1854, one Sampson County resident wrote: "... the time is not far distant when the state-



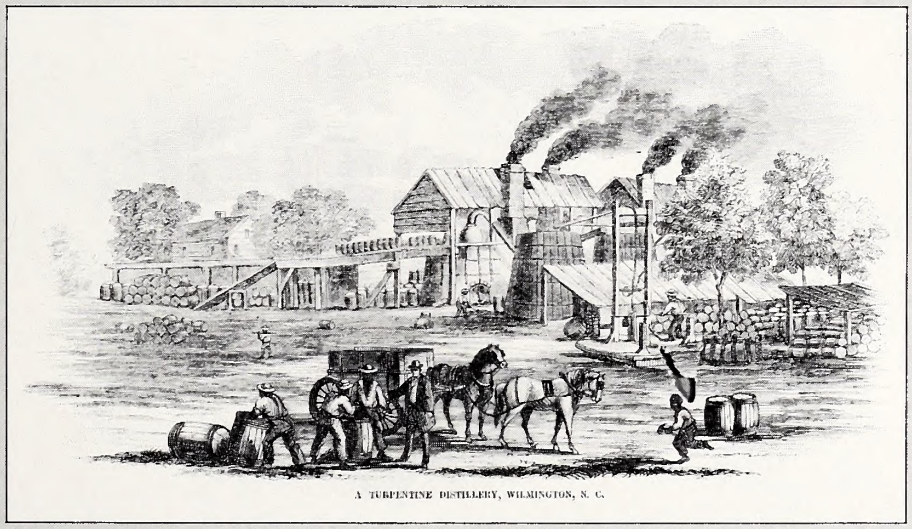
N.C. ARCHIVES AND HISTORY

Tar Heel Turpentining

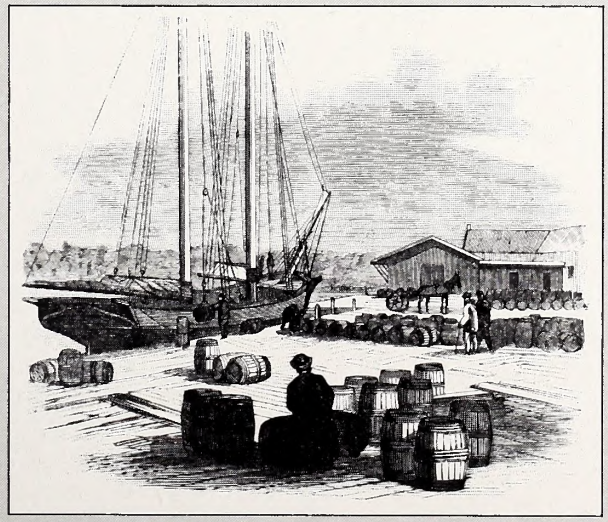
North Carolina's vast longleaf pine forests were the earliest industrial arenas in the state. The tree was rich in a gummy resin that produced tar, pitch, turpentine and rosin. Called gum naval stores, these products were sought worldwide for a multitude of uses.

Nineteenth-century travelers through the piney woods of North Carolina were fascinated by the naval stores industry and their accounts were frequently published in the popular magazines of the day. Top print shows slaves hacking the trees in spring and summer to induce the tree to bleed a sticky gum. The raw gum was collected and brought to piney woods distilleries near rivers (middle) where it was distilled into turpentine. Barrels of naval stores, including turpentine, were then rafted to ports like Wilmington (bottom) where they were exported all over the world.

Until the 1870s, North Carolina was the main source of naval stores, but as the trees were exhausted turpentiners abandoned the state for virgin forests in Georgia and Alabama. Today, some limited turpentining is still going on in states to the south.



A TURPENTINE DISTILLERY, WILMINGTON, N. C.



Looking For Longleaf

ly monarchs of the forest . . . will have been borne down by the unwearied worker at their feet and not one vestige of their former glory will remain. Aye well may you weep melancholy tree for your days are numbered."

By the early 1890s, turpentining and logging had laid waste to massive portions of the longleaf forest. State forester W.W. Ashe estimated that loggers were consuming the forest at nearly 500 million board feet a year, a pace that would exhaust the virgin piney woods within two decades. More disturbing, the longleaf was not regenerating in the cut-over lands, a phenomenon he blamed on free-ranging hogs that ate the pine seeds, on "a reckless system of turpentining" and on fires. He and Gifford Pinchot, soon to be Theodore Roosevelt's chief forester, also found that the loblolly pine had crept up from the creek bottoms to do battle with longleaf on its native grounds, and that longleaf was losing the struggle. One solution, said the two foresters, was "a complete protection from fires."

Though well-intentioned, this prescription doomed the remaining longleaf forests. For longleaf had evolved natural protection from fire, and it was frequent fire, occurring naturally over thousands of years in the longleaf belt, that had beaten back the loblollies and kept the scrub oaks at bay (See "People of the Pines," December 1986, for more on the ecology of the longleaf pine). It was frequent fire that had created the open, parklike vistas that had so delighted Bartram. In the 20th century, as ordinances prohibited the woodsburning commonly practiced by settlers (and by the Indians before them), the scrub oaks grew up in dense thickets and loblollies moved in to stay. In these dense forests the seedlings of the sun-seeking longleaf were shaded out.

In later years, the timber industry actively preferred the fast-growing loblollies and the transformation of the eastern landscape was completed. The forests were still green, still coniferous in many places, often astonishing

JANE ROHLING

***Fire is a** management tool used by the Wildlife Commission and other agencies to maintain the existing longleaf forests. Controlled fires keep these forests in an open condition and create conditions for natural regeneration.*

***Melancholy remnant of** North Carolina's majestic longleaf forest, the Boyd Tract near Southern Pines harbors trees over 300 years old. With fire suppressed, 40-foot hardwoods have encroached thickly beneath the pines, preventing longleaf regeneration and obscuring the open vistas of the original forest.*

in their vast coverage, but this was a replacement forest and it bore no resemblance to what had gone before.

Three

One March afternoon, I accompanied Jay Carter to the Boyd Tract, a satellite of the 600-acre Weymouth Woods, the Sandhills Nature Preserve near Southern Pines. For many years Carter has been doing research on red-cockaded woodpeckers in the Sandhills and he has become an expert on the longleaf pine ecosystem.

We were there to see an old-growth stand of longleaf owned and maintained by the state. The best known "virgin" longleaf grows near Thomasville, Georgia, on a tract of land managed by Tall Timbers Research Station. Tall Timbers control-burns the 250 acres of forest every two or three years, and as a result the rolling landscape is kept pleasingly open and airy, the kind of forest William Bartram saw two centuries ago on his journey to the Mississippi. Ecologists from throughout the Southeast make reverential pilgrimages to the forest to glimpse what seems to be the last longleaf stand in pre-settlement condition.

The old-growth forest Carter and I were walking in was quite different, however. It was so densely overgrown that it was hard to tell we were in a longleaf forest. Some of the hardwoods were as tall as the pines. Moodily, Carter noted the flat tops to the pines, the thick diameters of the trunks. "A lot of these trees are 250 to 400 years old," he said. He explained that the hardwoods had taken over because fire had been excluded in the years before the land was donated to the state. Now they were too big for a burn to have any effect.

"Take a walk through here some time. It's a real tragedy. This is the last old-growth stand of longleaf pine in the state. This is it, 25 acres out of something like 10 million acres. And they're just being allowed to decay into senescence.

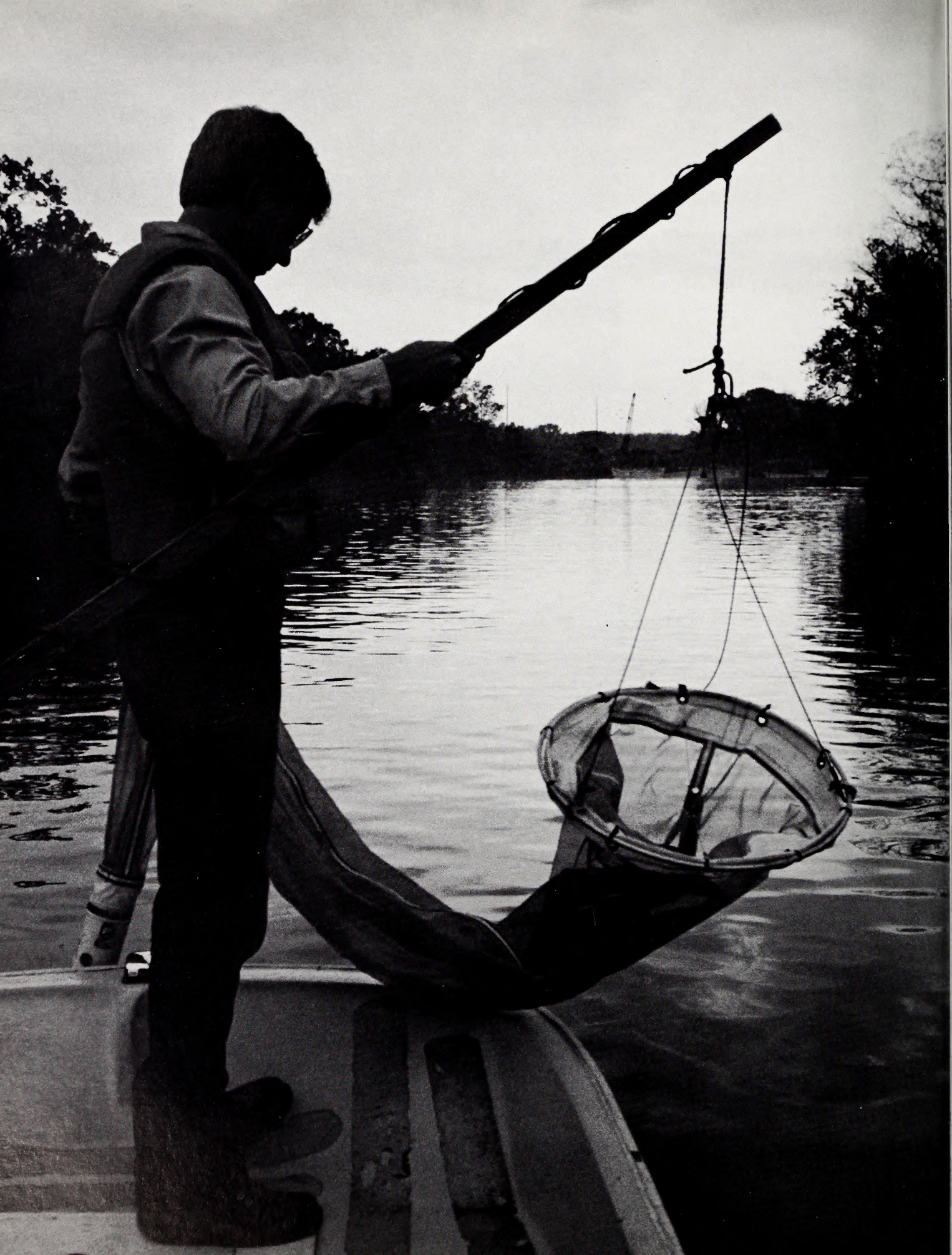
"Everywhere you go, the remaining longleaf is being exploited," he said. "People cutting timber, heavy equipment tearing up the soil. The state was built on longleaf, but there's really no concern any longer about preserving any of it."

We turned around and walked out of the woods.

After I dropped Carter off at his office, I returned to the forest and walked aimlessly along the bridle paths trying to imagine the forest as it might have been, as it could be, if Fred White has his way. Reality kept getting in the way, though. I could hear the steady pop of small-arms fire from nearby Fort Bragg, the thump of heavy ordnance.

Near the ridgetop, I found a cluster of turpentined longleaf surrounded by tall, encroaching oaks. The trees had been boxed, an older method of turpentining which meant that the gouge marks left by the hack, and still visible in the wood, probably dated from the 19th century. The bark had begun to grow over the bare face, folding inward like cooling lava. Slowly, the tree was healing itself. Once this tree and the others atop this ridge were part of an enormous and continuous forest that flowed, open and parklike, south across the Sandhills, into South Carolina and in a wide swath through Georgia. Down into central Florida it grew, across Alabama, Mississippi and west into Texas.

For a moment I could almost see it. ⊠



FISHY BUSINESS

District biologists stationed across the state learn to expect the unexpected as they work to provide good fishing and protect our freshwater fisheries.

by J.H. Davies

Sunlight sparkled on the waves below as Pete Kornegay, District 1 fisheries biologist, and Tony Mullis, coastal research coordinator, flew over the Albemarle Sound counting fishing boats. The aerial survey was part of a larger research project assessing the Sound's striped bass fishery.

Suddenly the plane gave a shudder and the propeller spun to a halt. Everything got real quiet, and Kornegay looked at Mullis. "Tony was pretty pale," Pete said, "and we must have been thinking the same thing — is this how it's going to end?"

The pilot radioed his situation to the Coast Guard Station at Elizabeth City, adding, "There are three bodies on board." Kornegay thought, "He said that so they'll know how many bodies to look for after the crash."

The pilot cursed his mechanic all the way down, but made a dandy landing in a soybean field. All three walked away without a scratch. Another day in the life of a fisheries biologist, albeit a bit more exciting than most.

What's it really like to be a state fisheries biologist? The N.C. Wildlife Resources Commission divides the state into nine districts and each is assigned a district fisheries biologist whose mission is to manage the freshwater sportfisheries in his district. At first glance, the work seems similar: survey, research, investigating fish kills and providing technical assistance. But a closer look reveals differences dictated by geography.

In Districts 1 and 2 in the northeast, the work more often involves big water — Albemarle and Pamlico sounds and mile-wide mouths of blackwater rivers that drain the Dismal Swamp and other lowlands. Largemouth bass and anadromous striped bass, which leave their marine homes to spawn in freshwater, are the species the biologists most often work with.

In District 1, Kornegay's primary work boat is an 18-foot boat powered by a 100-horsepower outboard. "It's a big, open skiff," he said, "but perfect for work on Albemarle Sound." The boat is rigged with a boom and davit, which Kornegay uses to pull a tucker trawl, collecting striped bass larvae. Kornegay is presently helping investigate the causes for the decline in the population of striped bass in Albemarle Sound.

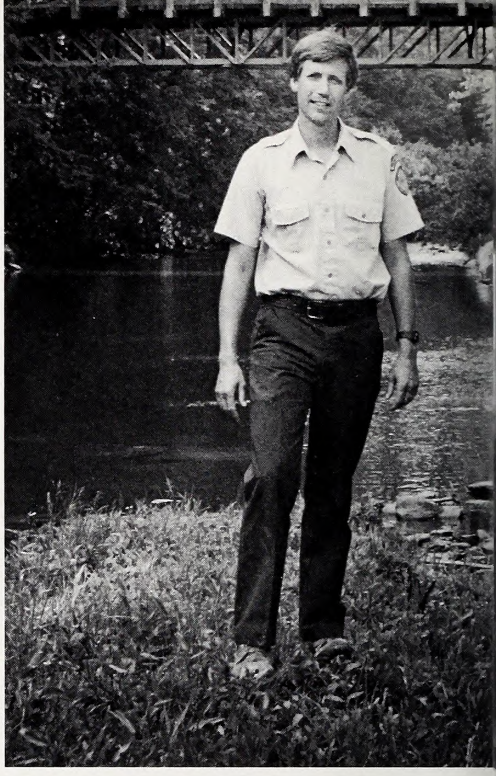
"Sometimes," Kornegay said, "the haze is so thick on the Sound that I can't see land and have to navigate using a compass. Having a relatively big boat is also very reassuring when the Sound turns from flat calm to 4-foot seas in a matter of minutes. We listen to the marine weather forecast every minute we're on the water."

Farther west in the Piedmont, District 5 stretches from Randolph to Rockingham and from Lee to Granville counties. "I'd say

In a summer twilight, *fisheries biologist Al Simpson (left) samples the Roanoke River for striped bass eggs. Projects such as the striped bass population study on the Roanoke are just one of many that occupy biologists' time. Biologist Roger Jones (below) helps a young angler at a recent CATCH clinic.*

KEN TAYLOR

LAWRENCE S. EARLEY



District fisheries biologists *from the Piedmont counties: l-r, Roger Jones (Graham); Wayne Jones (Zebulon); and Wayne Chapman (Albemarle).*

this district has more farm ponds than any other," said Roger Jones, the district's biologist. "We check close to 150 a year." Roger begins checking ponds in mid-March and doesn't stop until late October. Nuisance aquatic vegetation and out-of-balance fish populations are common ailments.

Jones is also participating in an investigation of the state's crappie fishery. The Wildlife Commission presently lacks a comprehensive data base on the state's crappie fishery and this study is designed to fill in the gaps. "Crappie run a close second in popularity to largemouth bass in North Carolina," he said. "We've looked at 7,000 to 9,000 crappie so far and when the study is completed, I estimate we will have looked at 20,000 to 30,000 fish." Most of the crappie will be captured with electrofishing equipment, which allows them to be released unharmed after they have been measured, weighed and a scale sample taken so they can be aged.

Like Kornegay in District 1, Jones has an 18-foot open boat with a 100-horsepower outboard to cut the massive Piedmont reservoirs down to size. But more frequently, he trailers a 14 footer with a 25-horse outboard. Gill netting, rotenone sampling and night electrofishing are everyday chores for the smaller boats.

Fishery biologists in the mountains have the same 14- and 16-foot open boats and big outboards used by most other biologists elsewhere in the state, but their most frequently used equipment is a pair of felt soled waders and a back-pack electric fish shocker used to inventory trout streams. Protecting the trout resource, while attempting to satisfy a growing public demand for the trout fishing experience, is often a tightwire act for the mountain district biologists.

Some anglers want to take home a "mess" of trout to eat. Through stocking and liberal regulations, the biologists hope to draw these anglers to streams with General (bait-fishing) regulations. These streams either cannot support trout year around, or do not have a normal, self-sustaining population of trout. Anglers who are less interested in harvest, but seek instead the experience of catching a wild trout, may choose to fish streams managed under the more restrictive Native regulations.

Across the state, the work of the district biologists varies considerably and there is no such thing as a typical day. It may start at 8 o'clock in the morning with phone calls and wind up with visits to farm ponds, with maybe a dredge-and-fill permit to review and comment on in between. After supper, or more likely on a Saturday morning or holiday, a fish kill may occur that draws the biologist out again. On another day, work may begin at sunset with a full night of electrofishing for largemouth bass or crappie.

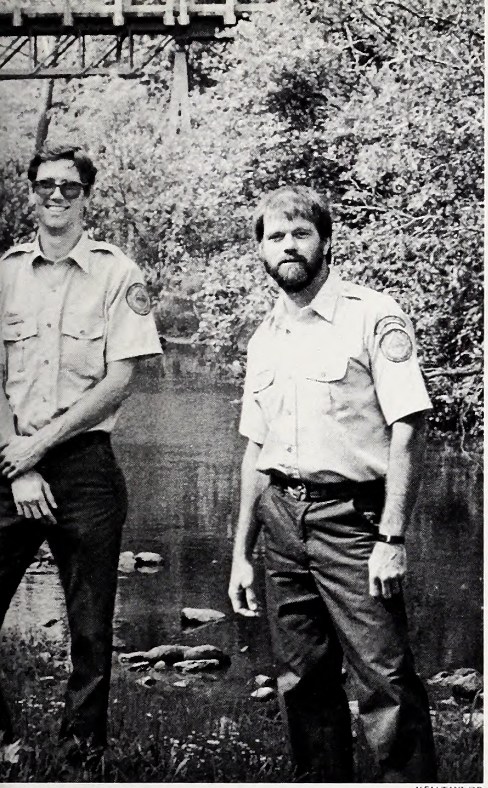
There are no stereotypes, either. Fishery biologists come in all sizes and shapes and although most are male, more and more are females. Some are native Tar Heels with a life-long familiarity with the state's water resources, but as many as a third or more at any given time have hailed from such places as Michigan, Iowa, Kansas, Virginia and elsewhere — a healthy addition because they bring in fresh ideas and broad experience that further enhances the already advanced science of fishery management.

The field of fishery management encompasses more than the work, however. It is also about people, and a largely verbal history has accumulated among our biologists, a compilation of stories, mostly humorous, involving exploits.

There is a rustic mountain lodge near Crossnore that has been the site of many Commission fishery meetings. When the sun has set and the formal meetings are over, the biologists often gather around a fire in the big stone fireplace and spin their yarns. The forced landing by Kornegay and Mullis is one of these. Another has been titled "The Day Cape Carnes Turned Blue."

Carnes is currently fisheries supervisor of the Piedmont Region, but he was a district biologist when he was asked to help a landowner rid his farm pond of some aquatic weeds. Carnes' recommended treatment was to dye the water, shading out the sunlight and killing the plants. Being an old Navy "salt," Cape improvised an ingenious delivery system by mixing a slurry of blue dye and water in the bottom of his boat. With the motor pushing the boat at a good clip, he pulled the drain plug, and the dye flowed out the drain hole where the propellor helped mix it with the water.

Noticeably pleased with himself, Cape motored around the pond, adding dye or water as needed to the slurry so there were always several gallons sloshing around inside



KEN TAYLOR

District fisheries biologists *from the mountain counties: l-r, Joe Mickey (State Road); Bennett Wynne (Canton); and Bob Brown (Morganton).*

KEN TAYLOR

District fisheries biologists *from the coastal counties: l-r, Keith Ashley (Elizabethtown); Pete Kornegay (Camden); and Kent Nelson (Winterville).*

the boat. Unfortunately, he didn't see a partially submerged stump. The boat struck it, throwing Carnes headlong into the slurry. The dye wouldn't wash off, and he figured he'd have to go into hiding until the stuff wore off. The next day — of course — he got a call. He was needed in the Commission's main office in Raleigh, pronto.

"But I can't," Carnes complained.

"It's urgent," said his supervisor.

"But I'm blue. I can't come to Raleigh."

The supervisor's reply was sympathetic, but firm. "Cape, we all have bad days. You'll just have to overcome it. We really need you."

"But you don't understand," wailed Cape. "I'm really BLUE!"

When the Wildlife Commission was formed by the State Legislature in 1947, Dr. Willis King, fresh from a stint as biologist in the Great Smoky Mountains National Park, was chosen to lead its budding fishery management program. He was full of new ideas and quickly set about hiring a cadre. One of the first was Hayden "Bud" Ratledge. Ratledge began work in 1949, having served as a Navy corpsman with the Marines in the Pacific during the war. "There were only a handful of us at first," he said. "No one to show us the way." But that didn't stop them as they began to apply the scientific principals of fisheries management they had learned in college.

One of Bud's first projects was managing trout fisheries on the old wildlife management areas. "Woodsmen ran the areas back then," he said, "and I would drive around to all of the western areas every month. The managers kept a log on every fisherman that came into the area: how long they'd fished, what they'd caught and whether or not it was a native or stocked fish." Mountain roads back then were a far cry from today's gleaming highways and the round trip took Ratledge nearly a week, working from 6 in the morning until 10 at night. Some of the management areas had no roads, and access was by foot trail that wound a mile or more across the ridges.

Some aspects of district fishery biologist work remain the same today — hard work and long hours — but there have been changes, too. Don Tobaben is a program manager for the Division of Boating and Inland Fisheries in Raleigh with 19 years experience as a fishery biologist.

"When the district biologist positions were set up, they were pretty autonomous," he said. "Each one decided what needed to be done and did it. Biologists used to team up on the larger projects, but handled day-to-day work themselves. Until the mid-'70s when technicians were hired for each district, more than one wife of a district fishery biologist helped her husband in the field running gill nets and doing other chores."

In the early days, the local wildlife enforcement officer represented the Wildlife Commission to most sportsmen, but according to Tobaben, the general public today is far more aware of the biologists, and appreciates the need for their expertise.

"District fishery biologists are more conscious of public relations than they were in the past," said Tobaben. "We include the public in all our planning and, within the confines of the resource, we try to tailor our management to meet the public's wishes.

"The ability to converse on a highly technical level with other professionals and then drop all the scientific jargon and talk 'brass tacks' with sportsmen is vital to building credibility with the public. And that's the cornerstone of the Commission's management approach," said Tobaben.

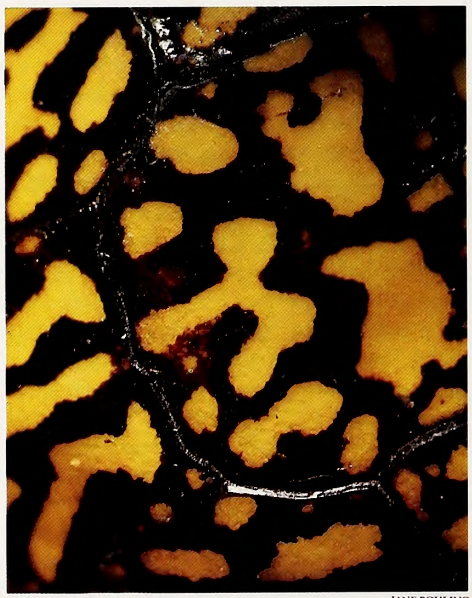
At the core of every district fishery biologist, however, is a fortune teller — for the essence of the job is to predict what will happen to a population of fish under certain conditions. Manipulation is possible, but always with caution, because uncontrollable and sometimes unknown variables can come into play.

And yet, this essential work continues as biologists learn from their setbacks and successes, and improve their results the next time. It's unlikely that fishery management will ever become a "cook book" with all the answers nailed down. And perhaps that's good, otherwise this fascinating work would not attract the Bud Ratledges, Cape Carneses and other capable biologists who take their stewardship of North Carolina's fishery resources so seriously — even on "blue" days. ⊠

HOME IS WHERE THE SHELL IS

Scientists studying the eastern box turtle have learned some fascinating things about these long-lived residents of our woodlands, even, possibly, why they cross the road.

by Jane Rohling



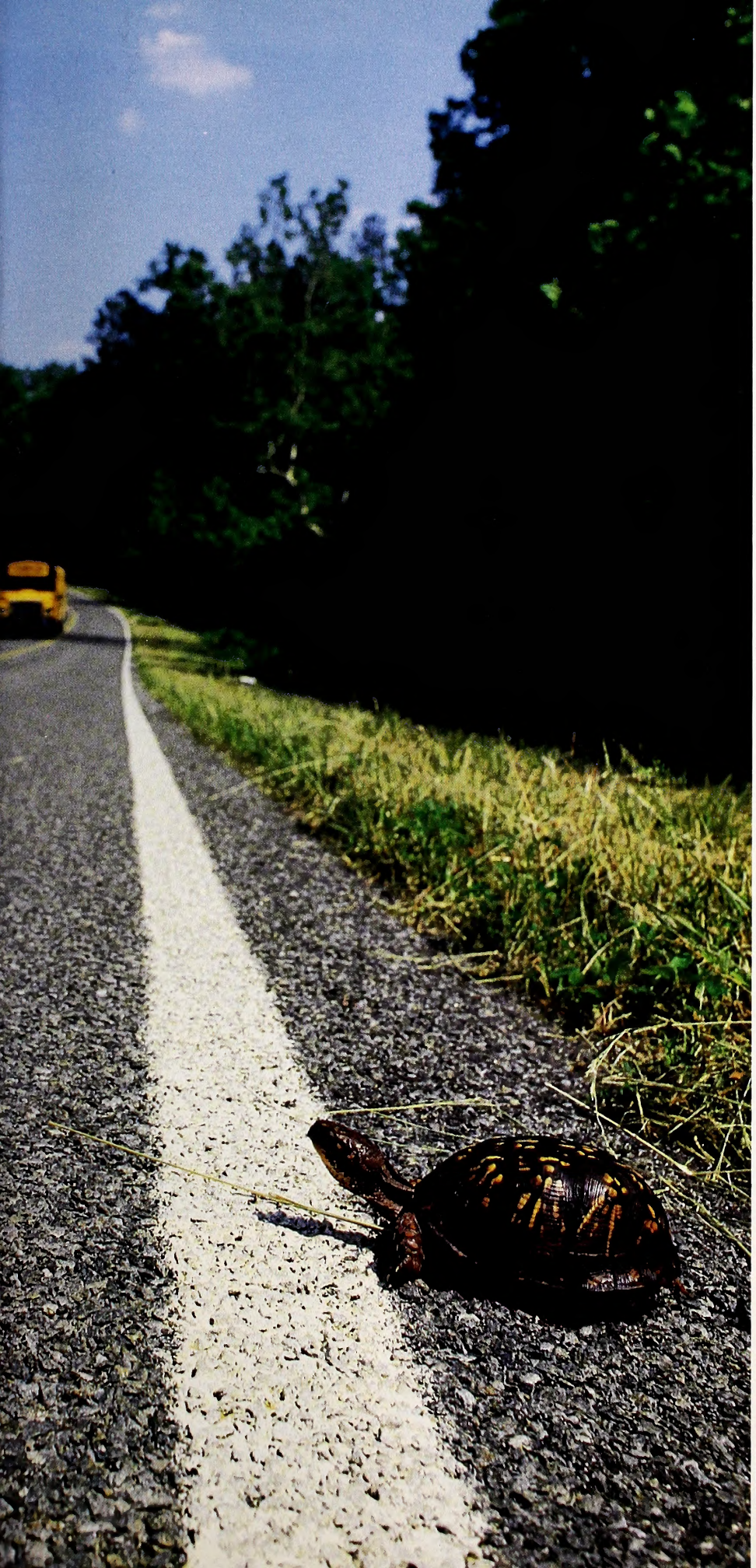
JANE ROHLING

I should leave home early whenever I go out on a warm, rainy morning because I make so many unscheduled stops to help box turtles across the road. I can't help it. I've always had a soft spot for the little guys, and unfortunately, a "spot" is all that would be left if a car passed at the wrong moment.

What could a box turtle hope to find in the road or on the other side? Zoologist Steve Hall has a better idea than most people. He spent a lot of time following box turtles while working on his Ph.D. at the University of North Carolina at Chapel Hill.

"What I wanted to do was actually map where different kinds of behavior took place," Steve explained. "Where was the turtle feeding? Where did it encounter other turtles? And so on. The idea was to get at the function of home range. Why do turtles stay within particular regions?"

Hall isn't the first person to study home range in box



JANE ROHLING

***Vehicles may be** a box turtle's biggest enemy. Turtles seen crossing a road are usually searching for a mate or looking for a place to lay their eggs. Since they often travel considerable distances in one direction, you may be able to prevent a turtle from being killed by removing it from the road and placing it at the edge of the woods in the direction it was headed. The brown, yellow and orange shell of the box turtle blends in well with the sunlight-dappled forest floor (opposite page).*

STEVE MASLOWSKI

***Young box turtles** are not much bigger than a quarter, and their shells have not yet developed the hinged closure, nor are they strong enough to withstand the bite of a raccoon or fox. Until they're larger and their shell can protect them, these young turtles escape predators by hiding under leaf litter.*

turtles. Back in 1926, Ruth Breder developed a technique for tracking turtles that has been the prototype for subsequent studies, including Hall's. She designed a tiny trailer which carried a spool of white thread, and attached the trailer to a turtle's shell. The loose end of the thread was anchored at the release point. As the turtle went about its daily activities, it left behind a trail of thread, weaving a web that would help researchers unravel some of the mysteries of its life. Other researchers have used trained dogs to help them find box turtles, and radio telemetry has been used, too.

The common box turtle, *Terrapene carolina*, is found throughout much of the eastern United States in at least one of four forms or subspecies. In the plains and deserts to the west, its cousin the ornate box turtle *(T. ornata)* fills the niche. The eastern box turtle, *T. carolina carolina*, ranges from southern Maine to Georgia and west to Michigan, Illinois and Tennessee. Its larger ancestors, *T. carolina putnami* and *T. ornata longinsulae*, plodded through the Pleistocene and Pliocene before them. The fossil record shows that these creatures have changed little over the years, a testament to the quality of the *Terrapene* design.

Although the box turtle's shell isn't sleek and streamlined like an aquatic turtle shell, its domed carapace (upper shell) is ideally adapted to protect it from terrestrial predators. It is virtually crushproof (auto tires notwithstanding), and the plastron, or bottom half of the shell, is hinged. When danger approaches, the turtle simply gives a hiss, expelling excess air from its lungs to make room inside for its extremeties, and closes up tight.

Box turtles are also well-camouflaged — the browns, yellows and oranges of their shells blend in with leaf litter. The brighter spots and streaks simulate the pattern of dappled sunlight as it filters through the forest canopy. The purpose of the bold patterns of red, orange, yellow and white on the skin of the turtles is not clear, but it may help individuals with overlapping ranges recognize each other. Or, it may assist in courting rituals.

Young box turtles are the most vulnerable. They're roughly the size of a silver dollar — just about bite size for a raccoon or fox — and their shells are much flatter than the adult's. Also, the plastron doesn't develop its hinge during those first years; therefore, young turtles escape detection by hiding in the leaf litter, foraging on invertebrates and fungi, and relying on camouflage and immobility to protect them from predators.

"By the time they are about 3 years old, their shell is more or less like the adult's, and that's when you begin seeing them," Hall

said, noting that he's found only a couple of hatchlings. At about 4 to 5 years old, when they become mature, their armor is practically impenetrable, and it's not unusual for individuals to live to be 50 to 60 years old. There are several records of turtles estimated to be over 100, and the granddaddy of them all reportedly lived to be 138!

Box turtles have definite home ranges and spend most of their time within these invisible boundaries, though the reasons are not clear. The home range for adults appears to

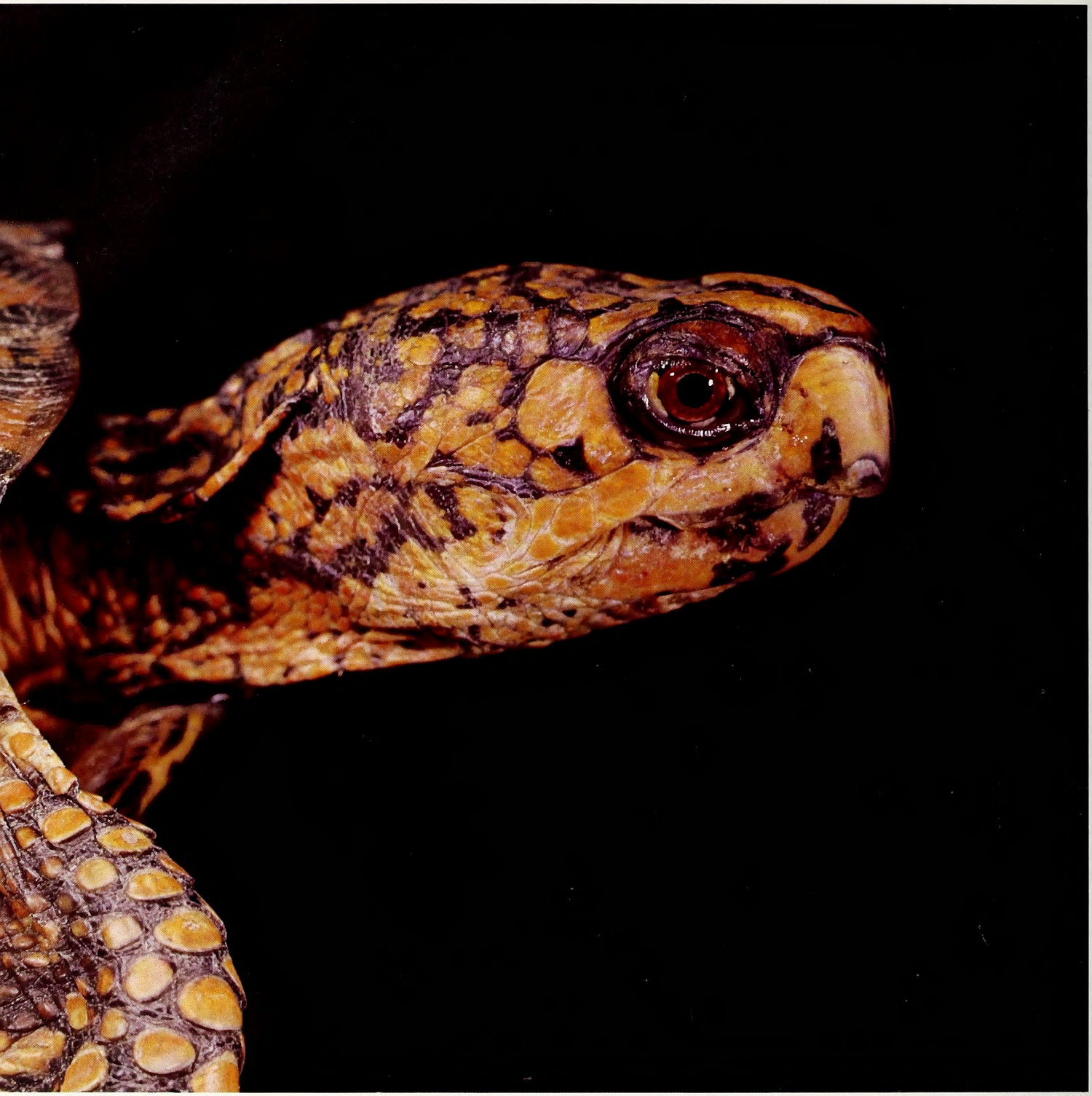
KEN TAYLOR

***Adult box turtles** often live to be 60 years old and are capable of living for a century or longer. They also have surprisingly large home ranges, averaging 5 to 10 acres. Some may have a home range as large as 25 acres.*

average somewhere between 5 and 10 acres (occasionally 25 or more), and movements within this range don't seem to follow any particular pattern.

"With a lot of animals, home range is associated with having a permanent refuge — a burrow, nest or a territory that the animal defends from other members of the same species," says Hall, "but the box turtle has no need of a permanent refuge — it carries its home on its back. Furthermore, it is generally a solitary creature, and is not aggressive towards other box turtles. Indeed, many turtles share overlapping home ranges."

Box turtles occupy a wide variety of habitats. They seem to prefer mixed hardwood forests with lots of mature trees and intermittent openings in the canopy that allow sunlight to reach the ground where they occasionally bask in the warm rays. Brush piles, flood debris, and tangles of vines and briers that characterize bottomland forests, cover a complex network of turtle trails. Each evening, turtles retreat to this kind of cover, hol-



KARL H. MASLOWSKI

The colorful skin *patterns of box turtles may help individuals recognize each other, or they may serve in attracting a mate. Eye color also offers a clue to identify the sexes. Male turtles generally have red or orange in the iris, while females usually have brown irises.*

lowing out a shallow bed where they spend the night.

When the warmth of the morning sun reaches the forest floor, the box turtle's day begins, but activity varies with the time of year. In summer, the turtles are most active early in the morning; in fall they are more mobile during the warmth of the afternoon. They may wander about feeding for an hour or so, then find a spot to bask in the sun if the weather's cool. If it's warm, they may crawl under a few leaves or seek out a muddy stream bank. During hot, dry weather they sometimes soak in muddy pools — occasionally congregating in large numbers. Once, more than 40 box turtles were collected in an Illinois marsh on a single summer visit!

Rainy weather stimulates activity, and even captive turtles indoors know when it's raining outside.

"Even if they've been burrowed under the leaf litter for weeks, as soon as the first drop of rain falls, they're up and moving," says Hall. "It's probably to find food since that's

when fungi appear and the snails and slugs are out. For a box turtle, nothing beats escargot and mushrooms."

In addition to being gastropod gourmets, box turtles dine frequently on all kinds of juicy berries, as well as roots, stems, leaves and other plant parts. Most of their animal diet consists of invertebrates such as snails, beetles, worms, spiders and the like, or an occasional bird's egg, snake or salamander. They're not above eating carrion, either.

Though box turtles mostly wander randomly, occasionally a turtle seems to strike off in one direction as if it has a mission in mind. Sex and survival are the stimuli.

"Their mating opportunities are scattered haphazardly through time," Steve explained. "There's no distinct mating season. Box turtles mate whenever males and females encounter one another. Their populations are sparse (estimates range from four to 14 per acre), and the chances of a male and female encountering each other are fairly low throughout the year. To counter that, they have adaptations like sperm storage. Females can store sperm for up to four years after a given mating and still lay viable clutches of eggs."

Some of the most lengthy turtle trips are undertaken by females intent on finding a place to lay their eggs. Between May and July, a female box turtle might lay as many as three clutches of eggs, containing from two to eight eggs each. She may lay them within her normal home range, or travel great distances (by turtle standards), returning to favorite nesting sites year after year.

"I have one female that for three years in a row in early June traveled a half mile from where she normally spent her time to an old field, then showed up back in her home range a couple of weeks later," said Hall.

Turtles also tend to return to certain hibernation sites year after year. Cold is a terrapin's worst enemy, and beginning about the time of the first killing frost in the fall until the last killing frost of spring, they bury themselves alive under up to 2 feet of leaf litter and soil.

When it suits them, box turtles have a well-developed sense of direction, and have been observed to take the most direct route in their destination, avoiding obstacles along the way. Box turtles that have been displaced over 5 miles from their home ranges have immediately headed off in a homeward direction upon release. While the use of visual landmarks and scent clues may help a turtle navigate in its home range, celestial navigation may also play an important role in unfamiliar territory. One study showed that turtles were unable to navigate on overcast days, but once they had taken a bearing with the help of the sun, they were able to continue in the correct direction even if clouds returned.

Oddly, some turtles, usually young adult males, do not settle on a home range right away, and this may be an important mechanism by which genes are transferred from one sedentary population to another. One such transient traveled over 6 miles in 15 months and was seen mating with two different females, and in the company of four others.

Hall and other turtle trackers think that, most likely, the box turtles found on the road are away from their home ranges for one reason or another. Those on egg-laying missions, those in search of winter retreats, those traveling between two separate home ranges, or those living where development suddenly disrupts the home range may also be forced out onto the road.

"It's common sense to imagine that if a turtle has a home range that has a road cutting through it, sooner or later that turtle's going to get hit."

Hall agrees that it may be worthwhile to assist box turtles caught in traffic, and he even suggests which side of the road to deposit your charge.

"Since turtles have strong directional tendencies, put it on the far side in the direction it was headed. It's most likely to keep going in that direction."

And it could easily outlive you — if both of you avoid future highway accidents.

Boys And Girls

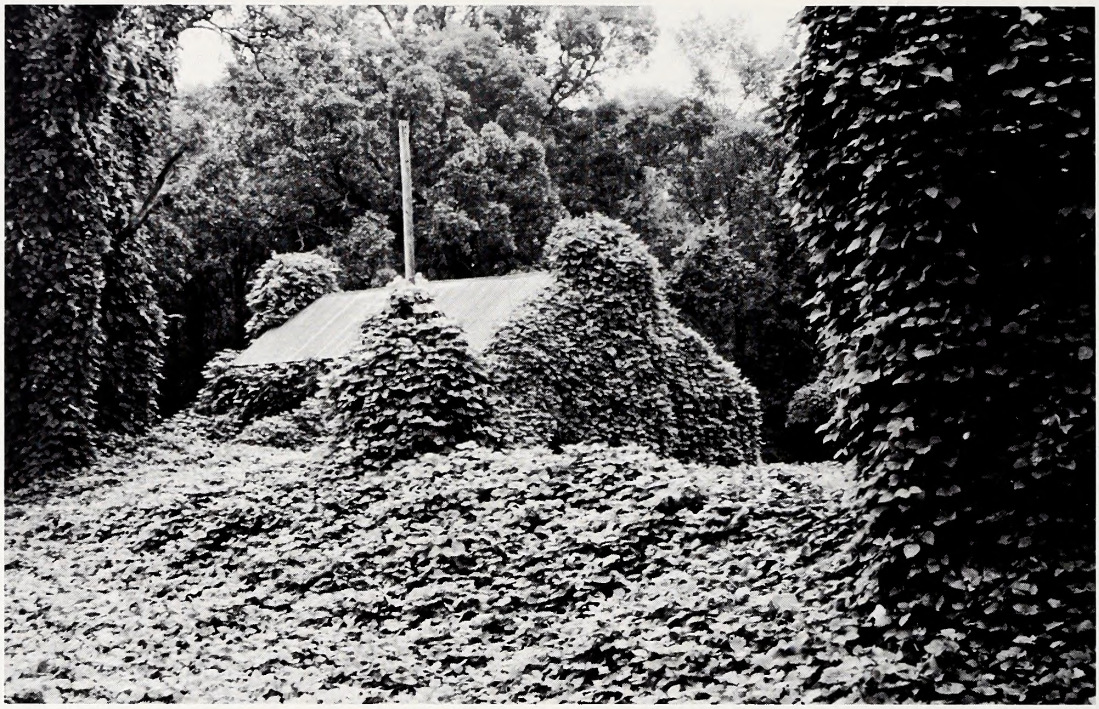
There are a lot of things we don't know yet about *Terrapene carolina*, but one thing we do know is how to tell the girls from the boys. So, if you'd like to impress your friends by sexing the next box turtle you run across (not over) . . . Here's what to look for:

Males *usually* have:
(1) A concave, posterior plastral lobe (a dish-like depression on the underside of their shell).
(2) Hind claws that are short and stocky and strongly curved.
(3) Longer, thicker tails than females.
(4) Red or orange irises in their eyes; often red in their skin.

Females *usually* have:
(1) A flat or slightly convex plastron.
(2) Hind claws that are thinner, straighter, and longer than the male's.
(3) Short, thin tail.
(4) Some shade of brown in their irises.

JANE ROHLING

A unique characteristic *of the box turtle (center) is its hinged "plastron" or lower shell. The forward portion can be closed for protection, and functions much the same as the gate on the bow of a naval landing craft. Aquatic turtles, such as the map turtle (right) and snapping turtle (left) lack this hinged plastron, and cannot close their shells completely. Instead, they rely on armored legs and their ability to swim and dive underwater to escape predators. The powerful jaws of the snapping turtle also discourage predators.*



***In its relentless** march, rampant kudzu covers an abandoned house.*

Mile-A-Minute Vine

Kudzu can cover entire landscapes — even houses, trees and telephone poles — in lush, green foliage, and is considered a pest. But surprise! This immigrant from the Far East has some real assets.

by Linda Freeman / photography by Jim Dean

When kudzu is around, even folks who know what it is are likely to feel uneasy. To someone unfamiliar with this rapacious vine, an outdoor encounter can be an extremely eerie experience. The lush, green vegetation grows voraciously over large chunks of the southern landscape, covering fence rows, bushes, tall trees — even buildings.

Like fried chicken and ham biscuits, kudzu has assumed a certain traditional status. Indeed, "Mile-a-minute" vine — tagged that for its rapid growth — is so entrenched in the Carolinas that former *Charlotte Observer* cartoonist, Doug Marlette, has named his never-say-die cartoon character after it. A first-timer to the North Carolina out-of-doors is likely to turn to a companion and say, "What *is* that stuff growing all over everything? It gives me the creeps!"

Kudzu, called *kuzu* in Japan, first came to the United States as part of the Japanese exhibit at our centennial celebration in Philadelphia in 1876. It is said to have originated in China. In the early 1900s it was widely used throughout the South as an ornamental covering for front porches, offering verdant shade from the hot summer sun. When a farmer in north Florida tired of his "porch vine" he ripped it out and threw it on his trash pile, only to discover that his chickens ate it — and thrived. That soon led to experimental feeding of livestock, and kudzu quickly gained acceptance as a pasture plant. Farmers began using it for mulch and baled it as hay for winter livestock feed.

During the New Deal, in an attempt to replenish nutrients depleted from the soil by years of growing cotton and peanuts, government agencies gave away millions of the nitrogen-fixing kudzu *(Pueraria lobata)* plants to southern farmers. But perhaps it was spread most rapidly during the Depression, when additional millions of the vines were planted along highway right-of-ways, providing not only much-needed jobs to those who did the planting, but a very effective means of controlling soil erosion.

"Planted in the right places for the right reasons, such as to hold extremely steep banks, kudzu does a good job," says Bruce Wilson of the Charlotte office of the U.S. Soil Conservation Service. "But sometimes

it does too good a job!"

Left unchecked, kudzu produces a new plant from nodes occurring every 12 inches along the vine. An established plant can grow 12 inches a day and from 50 to 100 feet in a season. Not quite a mile-a-minute, perhaps, but fast enough. Like a giant carrot, the plant has a deep taproot, which grows to 300 or 400 pounds, and a crown from which 40 or 50 vines radiate. It blooms in midsummer with clusters of pungent reddish-purple flowers which have the overpowering odor of crushed grapes.

Kudzu leaves drop at the first frost, but the vines don't die. Instead, they turn brown and dead-looking and hang heavily from the trees until spring. Then they simply pick up their insatiable growth where they left off the previous season, stretching sometimes for miles, blanketing the ground, cloaking the trees and smothering the surrounding vegetation.

Geographically, kudzu is limited only by the fact that it does not seem to tolerate extreme cold — although recently it has been found growing heartily in protected areas as far north as Philadelphia.

Because it is such a predacious grower, suburban backyard gardeners and farmers often find the pesky stuff insinuating itself into places where it is not wanted. If you find it encroaching on your yard or garden, Ted Caudle, Mecklenburg County Extension Horticulturist, suggests three methods most commonly used for keeping it under control: keep the plant trimmed off at the ground, dig it up, or apply a good weed killer.

A weed whip with a whirling monofilament line works well to keep it trimmed. Persistence is the key here. Even though the root system is very supportive, eventually complete trimming cuts off enough nutrition so the plant will starve.

As for digging it up, Caudle says with a chuckle that folks who try this are mostly stooped of shoulder and wrinkled of brow. It is obviously not his method of choice.

Weed killer is probably the most satisfactory means of control, and Caudle recommends a compound containing the herbicide glyphosate, commonly sold under such brand names as Round Up, Kleen Up and Blot Out. The use of glyphosate controls kudzu, killing exposed vegetation and, eventually, the root system. The chemical is totally inactivated in the soil and, in addition, the fumes won't blow into your neighbor's yard and kill his prize roses or run into the stream and sicken his cows. The chemical should be applied according to label directions, during the vine's active growing stage — at or beyond the blooming stage. But even if directions are followed to the letter, Caudle warns that more than one application will probably be necessary to kill the root system.

***Although kudzu can** control erosion and feed livestock, it more often becomes a pest. Unchecked, it will blanket many acres, wrapping up trees, houses, even telephone poles. Once it reaches this stage, eradication is so costly that landowners simply give up in defeat.*

Once an area as large as a field is overtaken by kudzu it can be kept in check by plowing, but is nearly impossible to get rid of. Many modern-day farmers are therefore seeking ways to turn the unruly growth into profit. Kudzu has high nutrient value for livestock and for grazing purposes, can be oversown with oats, rye grass, crimson clover or tall fescue. Kudzu hay is equal in feeding value to alfalfa, makes high yields per acre, does not have to be planted each year, does not leave the soil bare in spring, and is drought resistant. It can even be a tasty addition to the human diet, and all parts of the plant are edible. It is high in fiber and low in calories, cholesterol and sodium. Tips and young leaves are used in many Oriental recipes. A thickening agent similar to arrowroot can be made from kudzu roots and when boiled, the roots are said to taste much like sweet potatoes. Tendril tips can be cooked in the same way as asparagus.

Kudzu has been credited with medicinal properties in the Orient for centuries and has been used for everything from upset stomachs, hangovers, fevers, coughs, nasal congestion and asthma to gonorrhea and smallpox.

It is an effective stuffing for cushions, and its flowers are a source of honey. A kudzu-based fiber is used to make raincoats and paper. Experiments have shown possibilities for use in making gasohol. The vines of the kudzu plant can be fashioned into hammocks and baskets similar to those made in the lowlands of South Carolina. When burned, it is a mosquito repellent and recent research shows it may be ground up, mixed with a bacteria and used to kill the larvae of malaria-carrying insects.

On the other hand, the weight of exuberant kudzu pulls down telephone lines and power poles. In some areas, phone companies have had to resort to underground lines. Power companies spray to prevent the plants from sending tentacles up high voltage towers shorting out transmission lines and transformers. Highway departments must spray and mow to keep the dense foliage from shielding the pavement from the sun causing moisture retention which contributes to the deterioration and break-up of roads and bridges.

Stories about the rapid growth of kudzu make colorful conversation around pot-bellied stoves in the back rooms of general stores — stories of slow cows ensnared in the vine, of tops lifted off wells overnight, of vanished farm implements. Dire predictions are made — only half in jest — about those who sleep with windows open.

When kudzu stalks, it might just come inside and wrap 'em up.

Kudzu Recipes

Kudzu Salad

Mix tender kudzu leaves and tendril tips with dandelion greens and lettuce. Cover in hot oil. Season to taste.

Kudzu Colada

Put tender kudzu leaves and tendril tips into blender. Add a dash of rum and sugar to taste. Blend with crushed ice.

Kudzu Tempura Chips

½ cup all-purpose flour
½ cup cornmeal
2 Tbs. cornstarch
1 tsp. baking powder
½ tsp. salt
2 egg whites, lightly beaten
1 cup ice water
peanut oil

Combine dry ingredients. Add egg whites and water. Stir until well blended. Batter should be lumpy. Dip leaves into batter and drop into oil heated to 375 degrees. Fry until golden brown. Drain and serve.

Props Wash Out Holes At Ramps

Boaters Beware Of "Bottomless Pits"

Written and Edited by Mark Taylor

"C'mon back" is a common cry at boat ramps but beware of going one "c'mon back" too far. The increased popularity of drive-on boat trailers has created a problem at some ramps — deep holes at the ends of the ramps that can swallow boats and trailers.

"When boaters gun their engines to load their boats onto these trailers, the prop wash runs down the ramp and digs out a hole at its end," said Cape Carnes, the Wildlife Commission's Piedmont supervisor for the Division of Boating and Inland Fisheries. "As water levels drop during the summer, boaters have to back farther down the ramp to unload their boats. Boaters who accidentally back off the ramp into one of these holes — which may be several feet deep — can severely damage their trailers if they try to pull both boat and trailer out with their vehicles."

Where this problem exists, the Wildlife Commission has placed signs marking the end of the boat ramps. Boaters should not back beyond the signs. These ramps are also being lengthened whenever possible, but this work is impossible when the ramps are under water.

If a boater backs into a hole, the boat should be taken off the trailer. Then, one or two people should manually lift the trailer as the driver eases it back onto the ramp. Reload the boat later in shallower water.

"We've erected signs at all of the ramps where we know there's a problem," said Carnes. "However, if someone backs into a hole on an unmarked ramp, please notify the Wildlife Commission and we'll post it."

Boaters who have drive-on trailers can also help remedy this situation by using the minimum amount of throttle needed when loading their boats.

— *Angela Hill*

JANE ROHLING

Back With Caution: *The growing popularity of drive-on trailers has created a problem at some boat ramps — deep holes at the end. Boaters should be careful not to back off the ends of ramps.*

Drift Fishing Is Productive

Hot Fishing For White Perch

August is a tough month for fishermen. If you don't mind the heat, though, fishing for white perch is excellent in some of our coastal waters and lakes. Currituck and Albemarle sounds and Lake Waccamaw are all good bets.

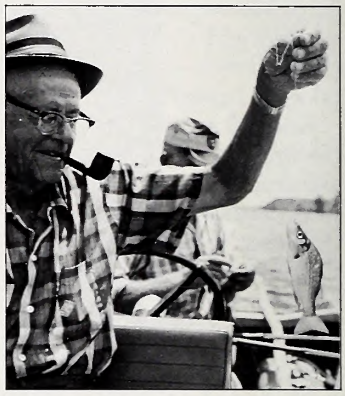
"White perch are schooling fish, and the most popular way to fish for them during late summer is to drift using live bait," said Jimmy Davis of Elizabethtown. Davis is the Wildlife Commission's coastal fisheries supervisor, and is also an avid white perch fisherman. "Small fathead minnows or shiners work well, and are usually fished 3 to 4 feet below the surface. A few small split-shot sinkers about 18 inches above the hook will sink your bait without killing the action. A piece of saltwater shrimp is also an old favorite."

These fish are found in big water, and there's no particular spot to fish. Whether you're on Lake Waccamaw or a coastal sound, the best option is to run well out into deep water and then drift with the wind until you find a school.

"It's important not to drift into the school and spook the fish," said Davis. "That's why drifting with the wind works so well. When you catch a fish, anchor immediately and cast to the school. It's not difficult to catch a dozen or more perch from the same school before they move on."

If there's little or no wind, trolling is also effective. Davis prefers a small, gold Mepps #1 spinner, although many spinnerbaits work well. As with fishing live bait, the trick is to locate a school. Then, stop trolling and cast to the fish.

Another way to find schools of white perch in Currituck and Albemarle sounds is to watch for flocks of seagulls. White perch, and also stripers in Albemarle Sound, feed on small baitfish at the surface, and gulls are attracted to the commotion.



Summer Treat: *White perch fishing in coastal waters peaks in mid-summer.*

Although white perch may be found anywhere in coastal waters, Davis prefers to fish river mouths. "I've usually done well at the mouth of Little River on the north side of Albemarle Sound," he said. "Any of the other coastal rivers should be good — they all carry food to the sound, and this attracts fish."

White perch average a half to three-quarters of a pound, although 2 pounders are occasionally taken in coastal waters. The fish fight well, and are also excellent eating. White perch don't freeze well, however, and quickly deteriorate in our 90 degree plus heat. Fishermen should bring a cooler and plenty of ice to preserve their catch.

The fish may be caught throughout the day, although Davis says early morning and late afternoon are best.

"I don't know if it's because you catch more fish, or if it's just more comfortable for fishermen that time of day," he said, laughing.

Will Be Mandatory This Year

Green-Winged Teal Featured On State Duck License/Stamp

A pair of green-winged teal dropping into a coastal marsh is a beautiful sight. You don't have to get up at dawn and slog through a swamp to see these ducks, however. Just buy one of the 1988 North Carolina Waterfowl stamps or art prints offered by the N.C. Wildlife Resources Commission.

The painting for this year's mandatory 1988 North Carolina Waterfowl Hunting License (stamp) is by nationally-known wildlife artist Ronald Louque of Orange, Virginia. In addition, Louque also designed 1988 duck stamps for Florida and Virginia. In 1984, he finished first in world competition sponsored by the Ward Foundation of Salisbury, Maryland, and for several years has finished in the top 10 for the national duck stamp competition.

Beginning with the 1988 hunting seasons, a state law passed during the 1987 session of the N.C. General Assembly makes the state waterfowl stamp mandatory for those who hunt waterfowl in North Carolina. The stamp is available from license agents across the state, and limited-edition art prints of the stamp may be ordered from art dealers.

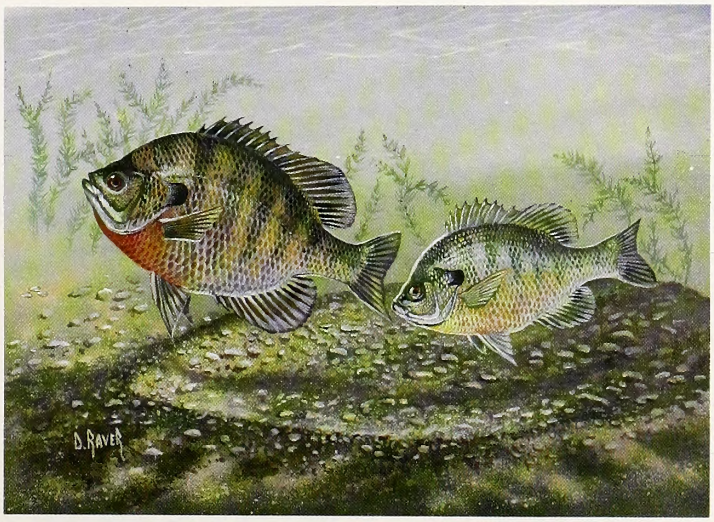
"Revenues from the sale of stamps and prints are placed in the North Carolina Waterfowl Fund, and are used for waterfowl conservation within the state," said Sid Baynes, chief of the Wildlife Commission's Division of Conservation Education, and contract administrator for stamp and print programs. "Buying a duck stamp or art print not only provides a beautiful addition to your home or office, but also helps build a better future for waterfowl in North Carolina."

— *Angela Hill*

Handsome New License: *The 1988 North Carolina Waterfowl Hunting license (stamp) features this print of a pair of green-winged teal dropping into a coastal marsh. The $5 license is mandatory this year to hunt waterfowl in the state. The lifetime sportsman's license, however, includes this hunting privilege. Also, limited edition prints of the stamp may be ordered through art dealers.*

A Beautiful Addition To Your Home

Sportsman's Print Features Bluegills



A Familiar Scene: *Bluegills are common across the state, and the beauty of a pair of spawning bluegills was captured by wildlife artist Duane Raver in the 1988 Sportsman's License Stamp. Prints of this stamp may be ordered through local art dealers.*

Employees Honored

Two Wildlife Commission employees, and a former executive director of the agency, were honored this year with Governor's Conservation Awards from the North Carolina Wildlife Federation. Governor Jim Martin presented the awards at the Federation's 43rd annual convention.

Tony Mullis of Greenville was named Wildlife Conservationist of the year. Mullis serves as the Wildlife Comission's coastal fisheries research coordinator, and was honored for his work with striped bass. Mullis has helped develop the Wildlife Commission's striped bass management program, and also serves as chairman of the American Fisheries Society's Southeastern Striped Bass Committee.

Jerry Brothers of Clarkton was named Wildlife Enforcement Officer of the Year. Brothers has spent much of his free time promoting conservation and outdoor safety programs with youth organizations, civic clubs, and wildlife clubs. He has been honored by the Future Farmers of America and county parks and recreation departments for his work in hunter and water safety. He has also participated in covert operations and search and rescue efforts.

Robert Hazel of Garner, who was employed for 30 years with the Wildlife Commission and served as executive director, was named North Carolina Conservationist of the Year. Following his retirement from the Wildlife Commission, Hazel joined the faculty of N.C. State University as a forest-wildlife extension specialist. He also serves on the board of directors of the N.C. Wildlife Federation.

— *Angela Hill*

Mortality Often High

Culling Fish A Deadly Practice

Many anglers cull fish, substituting larger fish after reaching the creel limit, and return the others to the water. However, even though the angler keeps only his legal limit of fish, culling often has the same effect as harvesting. Many culled fish die later from the stress of having been held in a live-well, bucket or on a stringer, even though they may appear healthy and swim away when released. Whether a culled fish survives depends upon its species, size, condition when caught, and the water temperature.

How can anglers reduce the negative impacts of culling? Before you go fishing decide if you want to keep any fish, and — if so — how many. Upon reaching your legal or personal creel limit, return any further fish caught to the water immediately. If you want to save "room" on the stringer for a possible lunker, begin immediately releasing fish before your limit is filled. At worse, you'll be only one fish shy of your limit, and you should have an opportunity to keep a legal fish towards the end of the trip. This reduces the stress on the fish, and will result in more fish for everyone.

Bottomland Print Offered

Proceeds from the sale of these prints will be placed in the Nongame and Endangered Wildlife Fund which supports a variety of nongame wildlife projects and the purchase of wildlife habitat in North Carolina. Each poster-sized, numbered print bears the North Carolina State seal, Governor Martin's signature, and the artist's signature.

Please send me _____ 1987 Nongame and Endangered Wildlife Prints @ $25.00 each $_____

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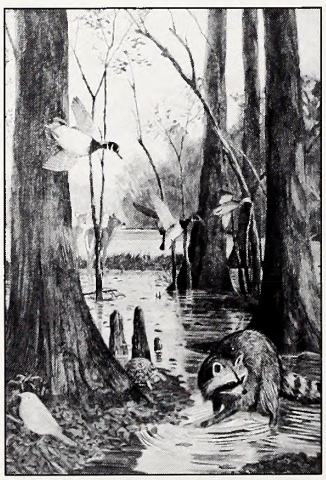

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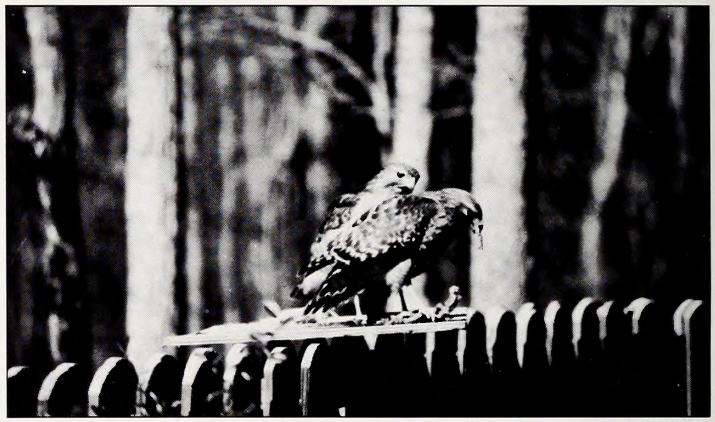
Raptors Visit Window Feeder

Reader And Hawk Play Cat And Mouse



BRANT MASSEY

Chow Time: *These two hawks were captured on film last winter by reader Brant Massey of Durham. He spent three weeks trying to photograph the birds.*

Dear *Wildlife*:

I thought I'd pass on this photograph of two hawks taken last winter. The birds entertained my wife and I from the end of February until mid-March.

We normally feed wild birds sunflower seeds and regular bird seed, but since it had snowed we decided to make a smorgasbord for the birds and place it near a large kitchen window. This would allow us to better observe our feathered friends.

I have read in bird books that insect eaters would eat ground meat from time to time, so we decided to include it as one of our entrees. We also put out chopped raisins, apples, sliced oranges and a mixture of peanut butter, lard and cornmeal. All told, we attracted a very colorful show of many different birds.

Much to my surprise, however, the meat was gone every day when we got home from work. I thought maybe a cat or opossum was getting a free meal while we were gone. One Saturday morning, I decided to put some more meat out and keep a close watch to see what was eating it. About 9:30 that morning my wife, Christi, called me into the kitchen and said, "What's that." I looked out the window and what a surprise! — two hawks were eating the meat.

For the next three weeks, I got up early every morning to set out food and try to take some pictures. Unfortunately, there was not enough light before I had to leave for work. Finally, however, I got some good shots one weekend from inside the house. I used a Nikon FE with 100 ASA film and a Vivitar 75-205 millimeter zoom lens.

I think they are broad shouldered hawks, but I'm not certain. I'd appreciate knowing, and hope you enjoy these pictures as much as I enjoy reading your magazine each month.

— *Brant Massey*
Durham, N.C.

The birds in the photograph are red-shouldered hawks, common in woodlands and along forested river bottoms. Nice work. Not too many feeders attract raptors.

Good Reading

Official North Carolina Records of the Dixie Deer Classic (Vol. II) by Allen C. Basala with tables and maps by Dean F. Tucker. Published by the Wake County Wildlife Club, P.O. Box 12202, Raleigh, N.C. 27605. Available for $6.50 (includes mailing) from the same address.

The Dixie Deer Classic has attracted thousands of sportsmen since the Wake County Wildlife Club began hosting the event in 1981. Hunters enter trophy deer heads in several categories, and over the years the contest has generated an impressive amount of data pertaining to North Carolina's whitetail deer.

Allen Basala has compiled this information in this book. The text of the 114-page publication is short — most of it is devoted to tables showing the scores of the whitetails, where they were taken, and by what hunting methods.

Wildlife Photographer

Leonard Lee Rue Hosts Workshop

Wildlife photography is a fascinating hobby, and many amateurs envy the pictures taken by "pros." The dean of American wildlife photographers is Leonard Lee Rue III, and he'll be sharing some of his trade secrets at a special one-day workshop at the High Point Environmental Education Center on October 1.

Rue's photographs have appeared in over 1,200 publications, and his work is regularly featured in this magazine. He is also the author of 19 books and writes a monthly column for *Outdoor Photography* magazine.

The workshop will cover mammal, bird, reptile, landscape and closeup photography, and will include a special session on selling photographs to publications. Registration forms for the workshop are available from the High Point Environmental Education Center, 1228 Penny Road, High Point, N.C. 27260.

"We Know How It's Done"

Lady Anglers Get Their "Limit"

ILLUSTRATION BY JIM BROWN

The bubbling stream had just been stocked, and people were already gathering along its banks in hopes of taking home a mess of fat, mountain trout for supper. Wildlife District 9 Captain Ben Wade was there too, wearing plain clothes because he knew the temptation to take a few too many trout would be too much for some anglers.

Captain Wade worked quietly, stopping the anglers on the bridge to check their creel limits as they left the creek. He had written several citations for exceeding the creel limit when a pair of elderly women, who had been fishing up the creek, drove across the bridge. They stopped and Wade chatted with them for awhile before he asked how they did. One of the ladies smiled modestly and said, "Oh, we caught our limit and then some."

Confident that he had made another case, Wade identified himself and asked to see the fish. The driver handed him her keys, and said the fish were in the trunk. Wade expected to see a mess of fish, but despite a thorough search all he found was four trout — well under the legal limit.

Mildly exasperated, he walked back to the window and spoke to the driver.

"Ladies," he began. "You said you caught your limit and then some, but all I can find are four fish. Where are the rest?"

The driver — who was all of 65 — winked at Wade, and grinned.

"Captain," she said, "if the men can lie about how many fish they catch, the women can too."

— *Jay Davies*

The Wildlife Endowment Fund Report

The Wildlife Endowment Fund is supported by the sale of lifetime licenses, lifetime subscriptions to *Wildlife in North Carolina*, and tax-deductible contributions. Only the annual interest from this fund is used for wildlife conservation, and the fund will play a key role in supporting wildlife programs in the future. Interest is earned through investments made by the State Treasurer's Office. For more information, write to the Wildlife Endowment Fund, N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27611.

Status on May 31, 1988

	Numbers Sold	Revenue Received
Lifetime Sportsman's License	44,543	$14,460,970.74
Lifetime Hunting License	312	67,051.59
Lifetime Fishing License	3,394	643,636.09
Lifetime Subscriptions to Wildlife in N.C.	1,340	172,668.39
Contributions	—	112,458.20
Fund Total	49,589	$15,456,785.01
Total Interest Earned	$2,947,898.12	

Calendar Of Events

August 6-7
Revolutionary War Battle Reenactment and Skills Demonstration at the House on the Horseshoe State Historic Site in Carthage. Reenactment of a Revolutionary War skirmish, and exhibits of 18th-century camp life and crafts.

August 13
Byard Ray Folk Festival at the Brevard Music Center in Brevard. Appalachian folk music workshop and concert.

August 13
Annual Shrimp Festival at Snead's Ferry. Parade, arts, crafts, and of course, shrimp.

August 18
12th Annual Strange Seafood Exhibition at the North Carolina Maritime Museum in Beaufort. Sample nearly 50 different dishes of "non-traditional" seafood. For more information contact the N.C. Maritime Museum, 315 Front St., Beaufort, N.C. 28516.

August 20-21
Gun Show at the North Carolina State Fairgrounds in Raleigh.

August 27- September 5
42nd North Carolina Apple Festival in Hendersonville. Tours of apple orchards, cooking contests, and arts and crafts.

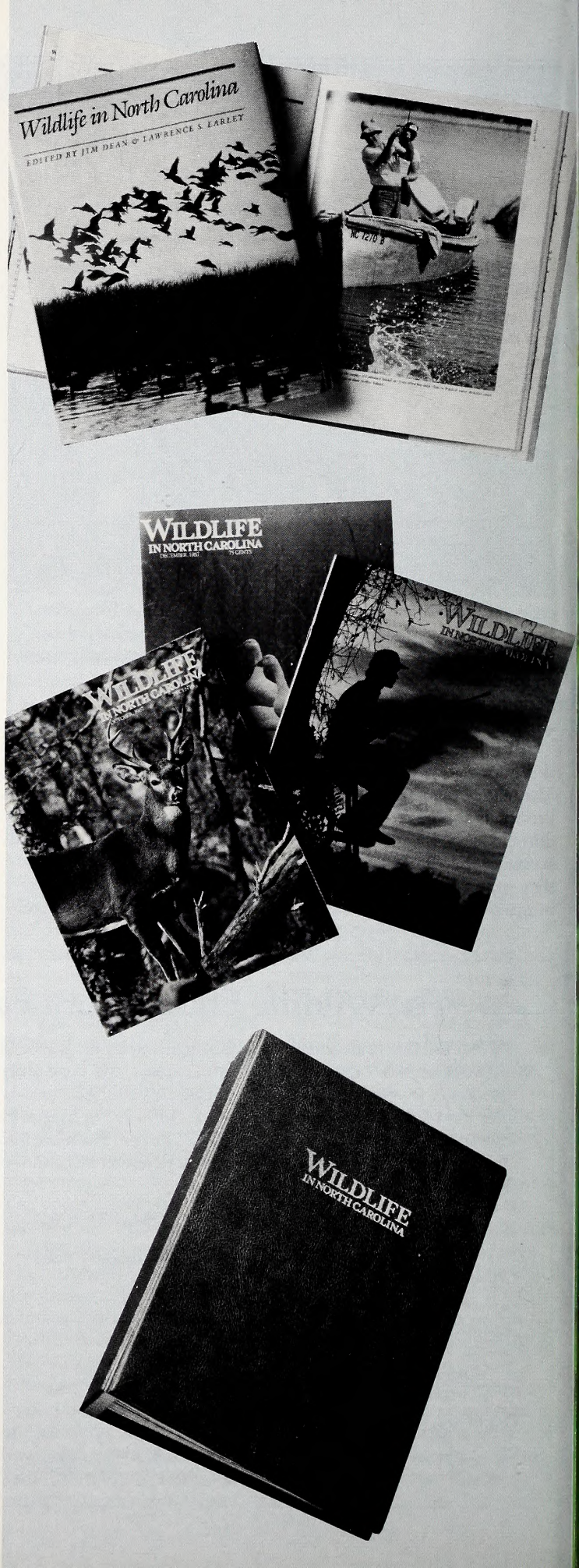
Everyone's talking about
Wildlife in North Carolina...
the book!

"This attractive book is probably intended for the sports or outdoors person; but in fact it should appeal to anyone with an active interest in our state's history, natural or otherwise."
— Michael McFee, *The Spectator*

"This book . . . is a fitting commemoration of the magazine's 50th anniversary. The book's four sections reflect the emphases seen each month, as the magazine seeks to interest nature lovers and environmentalists as well as the serious hunters and fishermen . . . ."
— Linda Brinson, Winston-Salem *Journal*

"It is not only for the sportsman in the family but for all the family and an excellent book to send both to Tar Heels who have moved away and to folks who have just moved into North Carolina . . . . The only fault I find with *Wildlife in North Carolina* is that it is not long enough."
— Bugs Barringer, Raleigh *News and Observer*

Published by the N.C. Wildlife Resources Commission and the University of North Carolina Press. Hardbound copy is $24.95 at your local bookstores.
Or order direct using the special order form on the opposite page.



You can help wildlife by contributing to the Wildlife Endowment Fund. Your donation or your purchase of a lifetime license or a lifetime subscription to *Wildlife in North Carolina* will help ensure the future of our wildlife (see form at left).

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Cooling Dip

Although the eastern box turtle is a creature of the forest, it will often seek relief from the heat in a puddle or pond.

LITHOGRAPHY BY EDWARDS & BROUGHTON COMPANY, RALEIGH, NORTH CAROLINA

WILDLIFE IN NORTH CAROLINA

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A Few Kind Words About Guns

by Jim Dean

"Return with me to those thrill-packed days of yesteryear." The voice belongs to Bruce Dunbar, radio announcer for Merita Bread. It is 6:30 p.m. any Monday, Wednesday or Friday in the late 1940s and early '50s. Suppertime. Lone Ranger time.

"From out of the past comes the thunder of hoofbeats and a hearty Hi-Yo, Silver," Dunbar says, his voice rising as "The William Tell Overture" fills the kitchen. Mom and Dad sit silently eating, exchanging an occasional bemused glance. I'm so carried away that I've accidentally eaten a butterbean.

Rossini's stirring music climaxes in a burst of shots, and Brace Beamer — the real Lone Ranger — urges the big horse Silver faster and faster until we are all galloping together through the long summer twilight. (Who is this Clayton Moore imposter, anyway?)

It was a time when my friends and I — barefoot, tanned, streaked with sweaty dirt — ran the alleys and backyards every summer day armed to the teeth. Some of us were cowboys. Others were Indians, by choice. We swapped off. When we couldn't be the Lone Ranger or Crazy Horse, we'd settle for the Durango Kid, or any other wrangler who didn't sing or cheat on his horse by kissing some girl.

ILLUSTRATION BY JACKIE PITTMAN

The only problem with pretending you were the Lone Ranger's faithful Indian sidekick was that Tonto usually went into town to get supplies and got the snot beat out of him by some local toughs. And the Lone Ranger, who was camped in a cottonwood grove on the north side of town (always the north side), would rescue him in a hail of silver bullets. Of course, Tonto did the rescuing sometimes, but we weren't yet mature enough to appreciate his gentle nature. Now, Crazy Horse or Red Cloud were another matter. They didn't take no guff.

When I was about 8 or 9 years old, my cap pistols got some serious competition from my first real gun — a Daisy Red Ryder lever-action carbine with a wood stock and a rawhide thong hanging from a ring alongside the action. With it came tubes of BBs and an exhaustive introduction to safety and ethics from Dad, Mom, Grandpa and every other relative who could gain an audience.

"Treat every gun as though it is loaded, and never point it at anyone even for the briefest moment," my father told me. Two motivations enforced those conditional instructions. I was being truly trusted for perhaps the first time in my life, and that meant a lot. I also knew I might lose the gun if I got caught misusing it.

For a lot of kids growing up in the rural south in those days, the gift of a BB gun was the first real test of responsibility. It was a darn good one, but only when that gift came with proper instruction. For those so entrusted, safe gun use became a matter of honor, something we were proud to know, proud to demonstrate.

As for me, I spent some of the happiest days of my life in dusty fields and along dirt roads in Northampton County, pockets bulging with tubes of BBs and the carbine always in hand. I was a mountain man disjuncted by birth to the flat pine East, walking the plowed rows, skirting the mysterious swamps. My provisions were raw peanuts straight from the stack, and a sweet stalk of sugar cane.

I filed the sights to correct my Daisy's tendency to shoot slightly to the left, and could pick off a Tru-Ade bottle cap at 20 feet riding past at a dead gallop on my stick pinto. Dry dirt clods in plowed fields were favorite targets because a hit yielded a satisfying puff of dust, proof of developing marksmanship, not unlike the ricochetting shots of a favorite Saturday matinee hero. Tin cans pinged nicely, but I was warned not to shoot bottles. Too many barefoot cowboys in these parts.

A confession. One day, I impulsively gunned down one of my grandmother's beloved catbirds in the hedge beside the smokehouse. That transgression cost me a sore rump and the temporary loss of my carbine. But I learned the difference between shooting mere tin cans and hunting. In addition to safety, a proper hunter must have an intricate code of ethics, respect for the quarry, and a tradition of ensuring that hunted populations prosper. Being an honorary Indian, I could understand that.

A few years later when the air piston on my carbine finally played out after about a million shots, Santa left a .22 rifle under the tree with my name on it. I never thought of it as a symbol of war or crime — as so many do today — but rather as a symbol of my parents' confidence.

I hope the era isn't ending when a kid can walk out his back door with his Red Ryder and find a field full of dirt clods, a woodlot full of wonder, and the ghosts of long dead cowboys and Indians. Not to mention a sense of responsibility.

But I'm not sure. Looks to me as though the cottonwood grove on the north side of town is being clearcut, paved and malled.

September, 1988
Volume 52, Number 9

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S. Thomas Rhodes / Secretary

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WILDLIFE IN NORTH CAROLINA

Wildlife in North Carolina is the official educational publication of the North Carolina Wildlife Resources Commission, and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources and the environment we share with them.

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Cover *A nice whitetailed buck rests in a mountain cove. Photograph by William S. Lea.*

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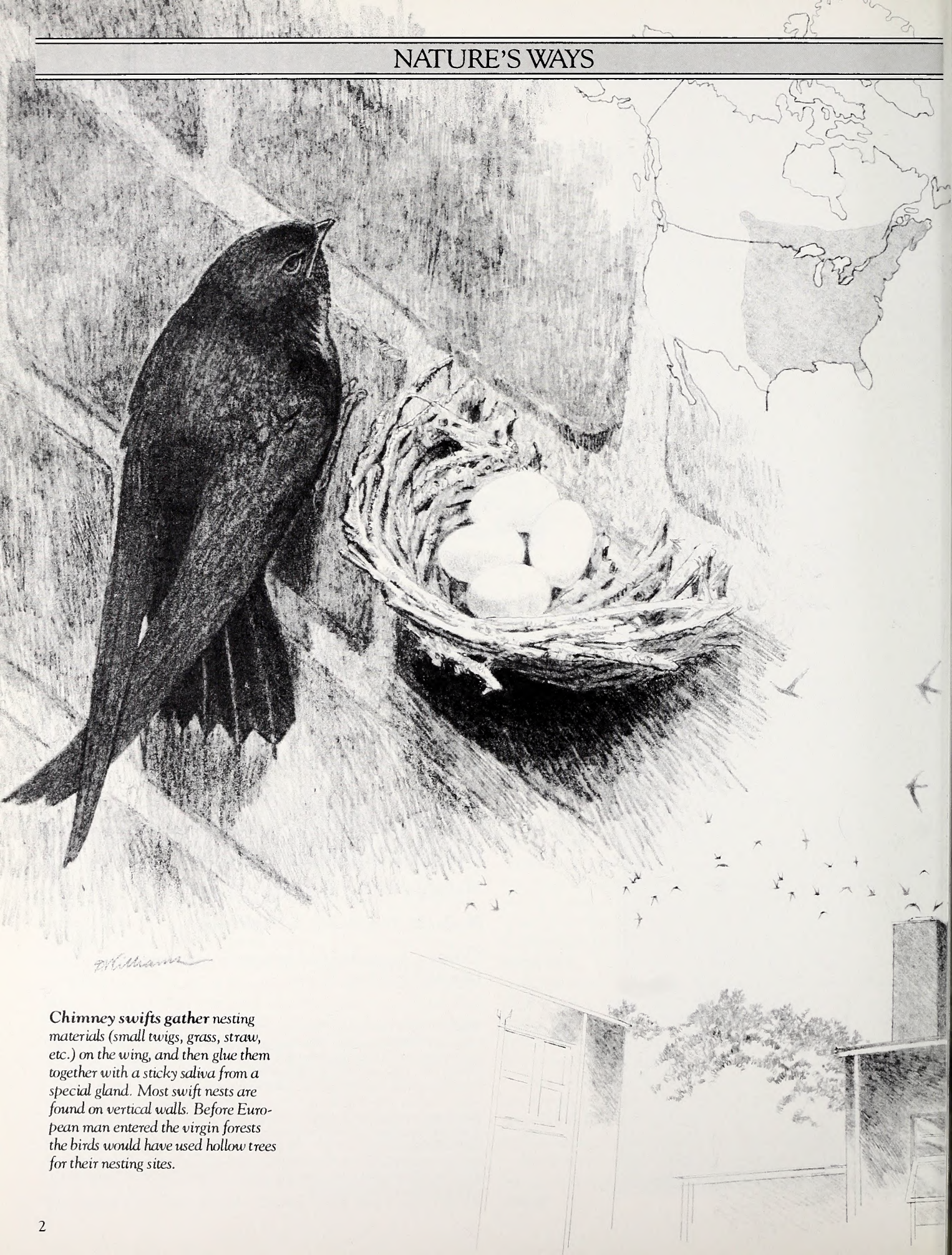


Chimney swifts gather *nesting materials (small twigs, grass, straw, etc.) on the wing, and then glue them together with a sticky saliva from a special gland. Most swift nests are found on vertical walls. Before European man entered the virgin forests the birds would have used hollow trees for their nesting sites.*

Masters Of The Air

written by Lawrence S. Earley / illustrated by David Williams

***Their crescent-shaped** wings identify chimney swifts as they wheel through the evening sky. In autumn, swifts roost in chimneys in great numbers. The migration destination of this common eastern North American bird was a mystery for many years, until bird bands, returned from the upper Amazon, identified Peru as its winter home.*

Though chimney swifts have been in North Carolina since March, autumn may be the time when you're most aware of these masterful aerialists. Freed from the parental duties that occupied them during the nesting season, swifts begin to form immense concentrations in September and October just before migrating south for the winter. You'll see them whirling recklessly in the sky near sunset and then plummeting *en masse* into a chimney as if following some lemminglike suicidal impulse.

But no, look into that chimney and you'll see hundreds if not thousands of the little swifts clinging safely, if precariously, to the vertical walls. A popular myth has it that swifts can't fly from a horizontal surface. Though they can, they are somewhat awkward at it and prefer taking off from trees, chimneys, cliffs and other vertical surfaces. Their legs are practically nonexistent (their scientific family name *Apodidae* means "without legs") but their feet, so clumsy on land, grip tightly to the side of a chimney. Stiff spines extending from the tail feathers help the birds prop themselves against walls, very much like woodpeckers.

But it is to a nearly continuous aerial life that the swallowlike swift is superbly oriented. Roger Tory Peterson calls the chimney swift "nearly all wings and mouth." With its long, thin wings it flies hundreds of miles a day in constant search of insects, which constitute its entire diet. During the nesting season, it can stuff over 1,000 insects at a time into its capacious mouth and then deposit the gooey mess down the ravenous gullets of its young. It gathers nesting materials on the wing, too, pulling dead twigs from the tips of branches. The chimney swift's European cousin, the common swift, mates on the wing and even sleeps on the wing.

The instinct to roost in chimneys is obviously of recent origin, but it is remarkable how quickly the swifts took to them. In the virgin forests of the East, their nocturnal destination would most likely have been a hollow tree. Audubon once witnessed 9,000 chimney swifts roosting in a hollow sycamore tree. Yet as early as the 1700s, according to Mark Catesby, an English naturalist who spent some time in North Carolina, swifts had found that the chimneys of forest cabins accommodated them just as well as the trees.

One autumn morning the swifts will be gone, migrating to their winter home in Peru. For centuries no one knew where they spent the winter, although there were many guesses. Catesby thought they migrated to Brazil. Some 20th-century observers were so stumped that they dusted off an old medieval view that swifts hibernated in winter. The mystery wasn't solved until 1944 when bird bands from 13 chimney swifts killed by primitive Indians were returned to the U.S. Fish and Wildlife Service from the American Embassy in Lima, Peru. The Indians at last had provided documentary proof of the swifts' winter destination.

In March the swifts return to North Carolina, drawn by their mating and nesting urges. They nest in colonies, though not in the giant concentrations of the fall. They make their nests of twigs and leaves, binding them with a glue produced from a saliva gland that enlarges 12-fold during the nesting season, only one of the unique abilities of this diminutive and adaptable bird.

The Specks Are Back, Again

Fishing has been slow for speckled trout along the coast in recent years, but these fine sportfish have returned in good numbers this year.

written and photographed
by Joel Arrington

Just about everybody who fishes has a special fondness for speckled trout, but for many years — up until recently — it was a slow pick in North Carolina waters.

Several factors may have contributed to low populations, including cold winters in the late 1970s. Researchers say trout are vulnerable to sustained water temperatures around freezing. Kills of millions of fish have been documented in the Gulf of Mexico. For whatever reasons, Tar Heel trout fell on hard times in the last decade, but began to make a comeback in 1985. Suddenly, big fish went off the graph last year. Citations awarded in 1987 for trout weighing 4 pounds or more in the North Carolina Salt Water Fishing Awards Program were almost four times the previous high in 1976.

Anglers can't agree on what to call *Cynoscion nebulosus*. The American Fisheries Society recommends *spotted seatrout*, but North Carolina anglers seem to prefer *speckled trout* to distinguish them from their relative, the *weakfish*, which we usually call *gray trout*.

Speckles are special because of their superior table qualities and sporting characteristics on light tackle. A filet is very fine simply broiled with butter and a squeeze of lemon. Ambitious chefs who try to get fancy may gild the lily. It takes a little extra skill to catch trout in most circumstances and anglers who have studied them and gained a lot of experience tend to enjoy more success than fishermen who are casually involved. But when trout are present and the water is not too cold, they are easy to catch.

Presuming the population will not collapse again this winter, local anglers could be in for a period of extraordinary trout fishing. There are basic facts you should know to help you share in the fun.

Speckled trout are shallow water fish. Only rarely will you find them in deep holes, although they will retreat to deeper water offshore in winter if it gets quite cold. We catch them most often in water less than 10 feet deep, often in or near grass flats, and in the surf.

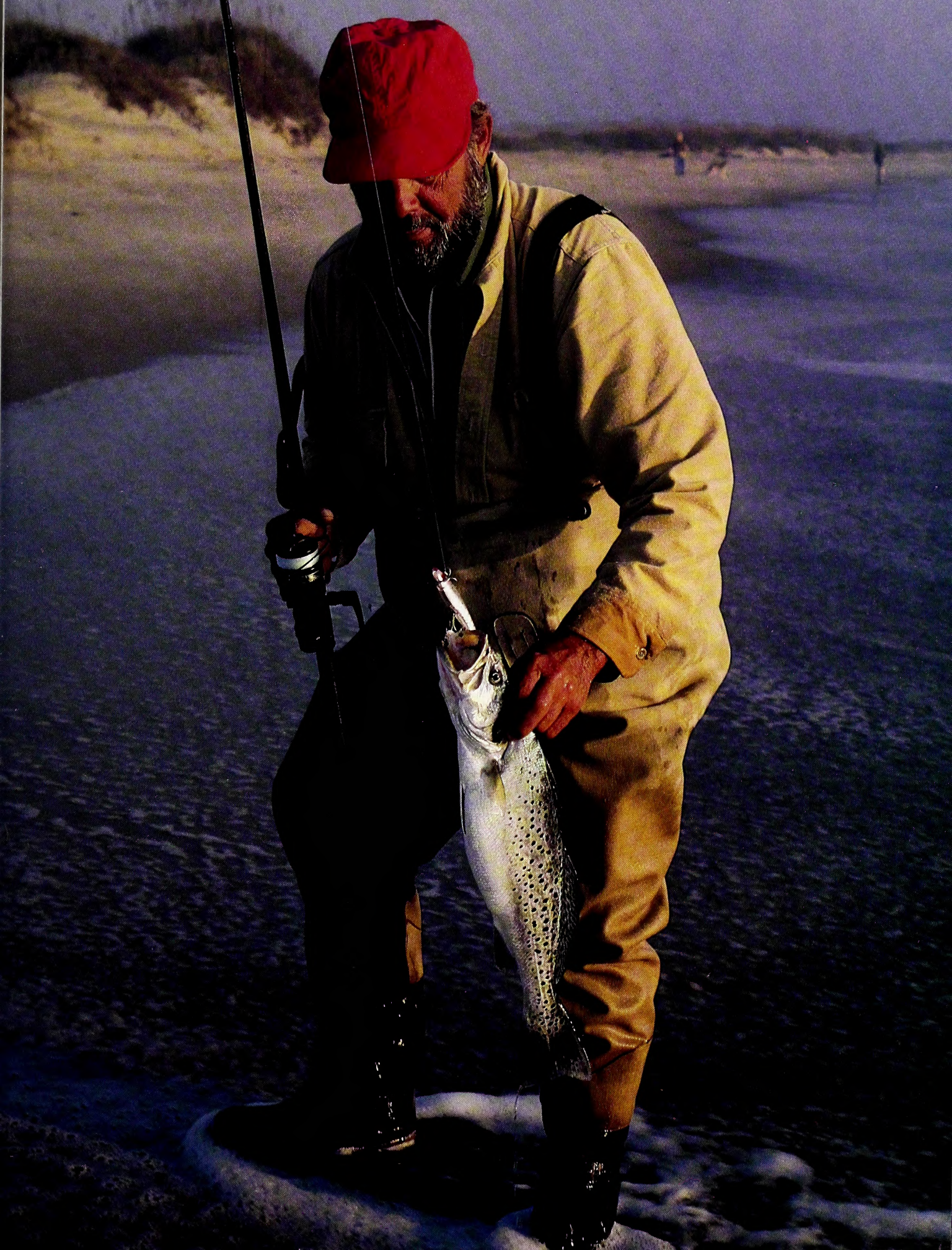
Throughout their range — which is, strictly speaking, from New England to Mexico, but practically from Maryland to Texas — trout are a fish of the estuary. They are tolerant of salinity extremes, remaining in river mouths and bays for most of their lives. Some, but not all, leave our sounds in winter to feed along the beaches and in near-shore waters and to escape cold, which is deadly in the shallows.

Everywhere but in North Carolina and Chesapeake Bay, speckled trout are resident. Some, if not all, fish at the northern extremity of their range migrate between sound and ocean and within Chesapeake Bay. Ocean beaches from Cape Romain to the Outer Banks have fall, winter and sometimes spring runs of speckled trout. Fall and winter are best, followed by spring, and finally summer, when the going is tough for any trout fan.

Fishing begins to improve in August and by September is in full swing in river mouths south of Cape Lookout and in the sounds north to Roanoke Island. October is the peak of this inside action. At some point great numbers of fish begin leaving the sounds and river mouths and can be caught for weeks around inlets and along the beaches. Inside fishing can still be good then.

The surf season begins in October when the water temperature falls below about 65 degrees F. Fishing continues strongly until about Christmas. In some years, more than

***Speckled trout** (also called spotted seatrout) have made a big comeback along the coast this year. This nice speck (right) was caught on a lure in the surf. North Carolina anglers tend to prefer lures for speckled trout (above), while in other states, fishermen more often use bait, especially live shrimp.*



In the fall *and winter, speckled trout can be caught on lures in sloughs behind sand bars along the surf, but they're also often caught in inlets. Other prime spots are deeper holes in the sounds or deep cuts and holes along the edges of marshes on the sound side. Experienced fishermen look for a hole that has a shell bottom.*

half the trout entered in the state fishing tournament have been caught in December and about 25 percent have been entered in November. So fishing for the big fish, at least, is best in cold weather. Water temperature is critical at this time, because when it falls below about 53 degrees, trout stop biting and may leave the surf zone entirely. Winter surf temperatures on the Outer Banks tend to hover around that point. Warm weather can raise it sufficiently to bring hungry fish into sloughs. An overnight weather shift can lower the water temperature a few degrees and shut you down for weeks.

After Christmas, fishing is more likely to be possible south of Cape Lookout, where it is warmer. In most years there is little opportunity in January and February on the Outer Banks, but trout can suddenly appear after a prolonged warm period. But fishing is usually in limbo until May, when there is a traditional fishery along the upper Outer Banks presumably for fish working their way back to Chesapeake Bay. Recently there has been good fishing into June for waders in the Coast Guard channel at Oregon Inlet. But

coast-wide, it's usually all but over by Memorial Day.

"Where are they when they're gone?" is the eternal question. No one can give a useful answer. "In the sound," is what you are likely to hear when you ask this question in summer. But summer catches in the sound or elsewhere are piddling compared to the fall, and there is no lack of effort. It is possible that trout feed less in the summer, when temperatures are above optimum, but I found no references to the phenomenon in a summary of research prepared by the N.C. Division of Marine Fisheries. Trout are presumed to feed sporadically at all times of year because so many are caught with empty stomachs, but to suppose they go for months without feeding seems unreasonable. Yet no one catches many trout in the summer.

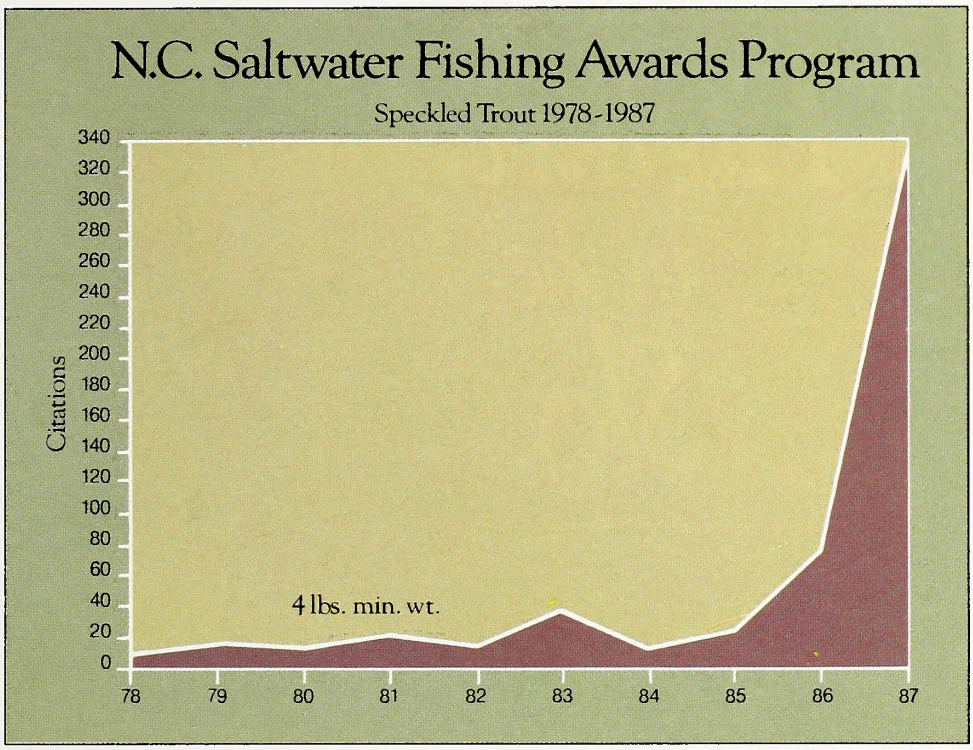
Researchers report that speckled trout live longer in the northern part of their range. However, despite the fact that the world record came from Chesapeake Bay, the biggest fish as a rule come from the Indian River Lagoon area of Florida's Atlantic coast. An 8-pounder there will not get your picture in the paper. In North Carolina, we admire anything over 3 pounds and a speckled trout over 4 pounds is edging into the trophy category. The state record weighed 12 pounds, 4 ounces when it was caught at Wrightsville Beach by John R. Kenyon, Jr., in late December of 1961.

Fish caught on hook-and-line will run much smaller early in the North Carolina season. From roughly late September until Thanksgiving you will want to fish from a small boat in shallow water near grass beds and along the edges of shoals inside the inlets and well back into river mouths and bays. You might like to cast a light one-handed spin rod of up to 7 feet in length, one that is balanced for 6- to 10-pound line and lures weighing up to about ⅝ ounce.

You probably will have your best luck at dawn and at dusk when the tide is running. Slack tides may not produce as well. The few days before and after full and new moons there may be such energetic tides that they reduce trout fishing success.

While, throughout the South, speckles are most often caught on bait, North Carolina anglers curiously prefer lures. We fish mostly grubs and mirror plugs. For shallow water fishing inside, grubs should weigh ¼ to ½ ounce, plugs ½ to ⅝ ounce. Color and dimensions of plugs are factors of variable personal preference. You see a lot of white grubs on red heads as well as bright, fluorescent colors in dingy water. Some trout specialists think they have found the answer and fish only one color of one lure.

Surf fishing may require a bit more rod, but the same range of lures. You need a graphite or boron/graphite rod about 7 feet long capable of casting a ⅜-ounce lure 100 feet easily on 8-pound line. Fit it with a graphite spin reel to make an especially light outfit for these typically small fish.



***Fishing for speckled trout** has had its ups and downs in recent years, but since 1984, the trend has been steadily upward. Last year set records for the state tournament with 335 citations. Applications for citations are available at many coastal fishing centers and tackle shops, or you can request more information from the Marine Fisheries Division, 3411 Arendell St., Morehead City, N.C. 28557.*

Tie lures on directly. No leader. I have come to like the 52MS, the 66 series and the TT11 MirrOlures. The 52 series weighs ½ ounce, the TT weighs ⅝ ounce. The 66 series is heavy for its size and therefore casts well and crawls the bottom. In the surf, you want the lightest lure that will bump bottom. You may have to go to the 68 series, which weighs ⅞ ounce, in heavy rips. Silver works well, but color may not be important.

When there is grass I can fish a grub with less bother. A commercial hook-and-line fisherman I spoke to at Hatteras Inlet used only Sting Ray Grubs on 12-pound line.

Trout may be anywhere in the surf, but veterans have come to recognize the type of slough where they are most likely to be. Often it is a shallow one, with a bar within 40 yards of the beach and a cut through the bar. Seas breaking over the bar fill the slough so that water rushes back out through the cut. You want to cast to the bar (beyond it a little if you can) at an angle across the alongshore current, so the lure will be swept along the bar and toward the cut. Expect a strike any time, but especially when it comes off the bar and drops back into the slough.

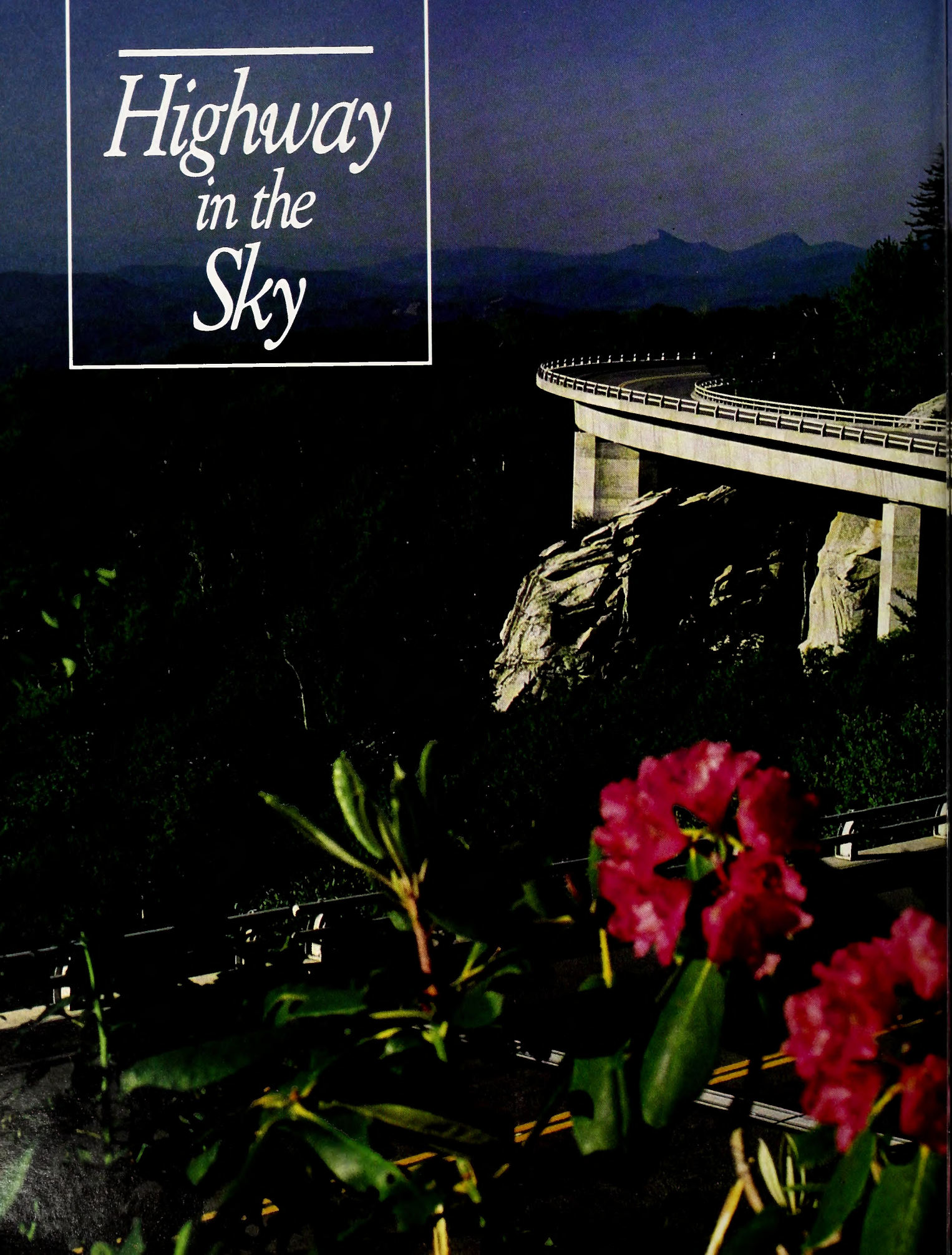
Low-stretch line is especially valuable in cold water when trout take lures tentatively. You will feel them better with a stiff rod and low-stretch line, like Prime Plus.

I used to do my surf trout fishing at night, but in my dotage have become a believer in daytime fishing. You may find fish on all tides, although I still prefer low, rising water. Don't overlook very shallow, narrow sloughs at high tide. Cast to the turbulent, white water on surf bars.

Bluefish can bring your trout fishing to a screeching halt. Many of us blamed the expanding population of giant blues for the dearth of speckled trout in the last decade. Now we have both the most bluefish we have seen in years and more speckled trout than many young fishermen have ever seen. But when blues move into your trout slough, you can hang it up for the time being. It's a good possibility these days. Probably several thousand pounds of trout were picked up like sea shells when schools of big blues chased them onto Outer Banks beaches last winter.

High winds are the other spoiler. Trout fishing requires mild weather. But red drum don't mind as much, so you only need to change tackle and tactics and you are in business until the trout come back. Still, many of us had rather have calm weather to fish light rods for little trout. Thankfully, they're back.

Highway in the Sky



The Blue Ridge Parkway is a remarkable engineering feat, and one of the most popular attractions in the Southeast. But it's not likely we could build it today.

by Jay Davies

There is an ache in the muscles near the base of my neck and my thighs burn as I force myself to continue pedaling my 10-speed bicycle up the long curving hill. My eyes are riveted to the black asphalt a few feet ahead of my front tire. Over and over I chant, "turn and burn" (turn the pedals and burn the thighs), hoping to lose myself in its repetition.

My brother, father and I are taking a week to bike 155 miles of the Blue Ridge Parkway, the portion between Pineola and its southern terminus at Oconaluftee. The week will prove to be physically challenging, but more than that, it will be emotionally uplifting because we are not riding on a highway. We are riding on a Parkway.

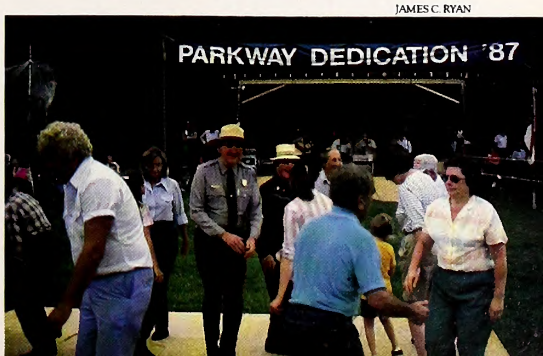
Bob Hope, the present resident landscape architect for the Blue Ridge Parkway, neatly frames the difference. "A highway gets people from one place to another," he says. "The Parkway is a destination, an objective in and of itself . . . What you do along the way becomes the objective."

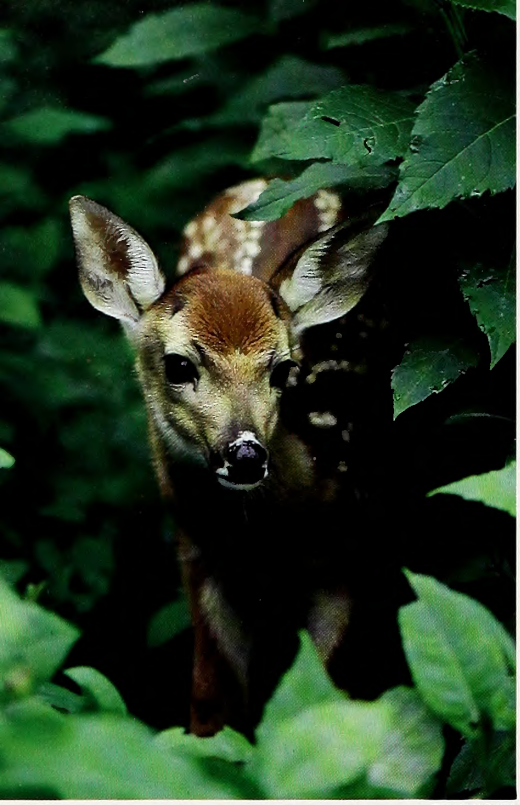
The Blue Ridge Parkway is a 470.2 mile long ribbon of asphalt that stretches between Shenandoah National Park in Virginia and Great Smoky Mountains National Park in North Carolina and Tennessee. As we alternately pumped hard to gain a crest, or

The Linncove Viaduct *bridges the final stretch of the Blue Ridge Parkway, a handsome elevated motorway that was completed with little adverse impact on the surrounding environment. Dancers (below) celebrate the completion of the Parkway at the dedication in 1987.*

HUGH MORTON

JAMES C. RYAN





WILLIAM S. LEA

Wildlife abounds in *the meadows, forests and mountain balds bordering the Blue Ridge Parkway. A whitetail fawn (above) peers cautiously at the photographer from its secluded hideaway. Mabry Mill (below) is a popular stop for visitors in the Virginia portion of the Parkway.*

coasted downhill from a summit, we were treated to spectacular mountain vistas, pastoral scenes and glimpses into the past. The roadway itself blends into these surroundings so thoroughly that you barely notice the work of man. At Bull Gap, for example, it was easy to imagine the last woodland buffalo still roaming the area, even though they have been extinct since the late 1700s.

The Parkway was conceived during the hard times of the Great Depression, a beginning that makes the achievement all the more incredible, but also perhaps more likely. Its construction offered hope for impoverished southern Appalachian people, and jobs where there were none. Some mountaineers envisioned, mistakenly, a hard-surfaced, "farm to market" road, that would help overcome their isolation from the rest of the country because of the area's lack of roads. Civic and government leaders in western North Carolina saw the Parkway in terms of the boost it would provide for the area's growing tourist industry.

Except for the perception that it would be a commercial highway, the Parkway did provide these things, and yet its lasting value, I think, is more than economic. Certainly with

KEN TAYLOR

***Ridges and peaks** of the Southern Appalachians march to the horizon from countless overlooks along the Blue Ridge Parkway where this bicyclist enjoys an early spring outing (above). Morning fog shrouds the mountains in mist (below).*

23 million visits in 1987, the Parkway afforded an unparalleled recreational experience for many, providing the opportunity to leave behind the cares and troubles of everyday life and rise up into the cool highlands to see nature's grandeur. It is in such experiences that the spirit of the Blue Ridge Parkway resides. And that is exactly what the Parkway's first superintendent, Stanley W. Abbott, envisioned.

Abbott, a landscape architect, was working for the Westchester County parkway system in New York when he was hired by the National Park Service in 1933. Initially, his work on the Blue Ridge Parkway was under the consultant Gilmore D. Clarke, a landscape architect with an international reputation, but the project quickly shifted to Abbott's shoulders when Clarke resigned in a dispute with Harold L. Ickes, the Secretary of the Interior. Consequently, the Parkway today stands largely as a reflection of Abbott's abilities.

Turmoil and hardship followed the early days of the Parkway like a bad penny. No sooner had Federal legislation authorizing funding for its construction been passed, when a dispute erupted over its route.

It had been agreed fairly early that the Parkway would run down the crest of the Blue Ridge in Virginia, enter North Carolina and run to Linville along the approximate route it takes today. South of there, however, the plans championed by Tennessee and North Carolina differed sharply.

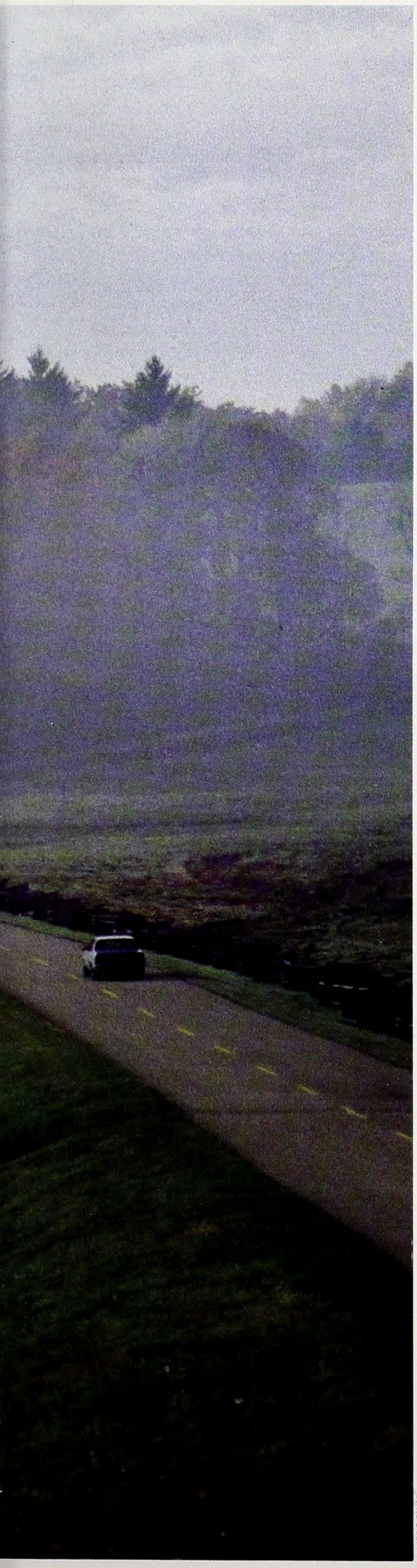
Tennessee proposed that the Parkway turn west at Linville, proceed to Roan Mountain, enter Tennessee and continue on to Gatlinburg and a terminus in Great Smoky National Park. North Carolinians on the other hand, argued that the route should remain entirely within their state and meet the park near Cherokee.

Secretary Ickes was to have the final say on the route, and he organized a series of public hearings to air the arguments from the opposing side.

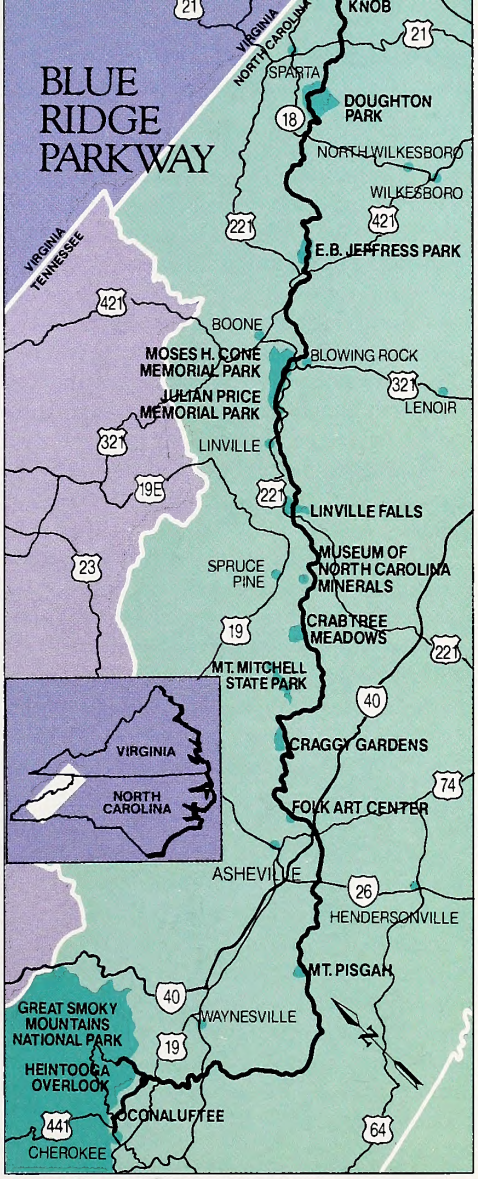
In a long, hot debate, civic leaders, newspapermen, governors, congressmen, Federal and state officials, and a multitude of "just plain folks" from both states wrote letters and contributed support. The arguments centered on two issues: Which route was economically most fair for all parties, and which would provide the most scenic views for Parkway travelers?

Finally, on November 10, 1934, Ickes made his decision. The Parkway would continue south through North Carolina. Tennessee already had a major entrance to Great Smoky Mountains National Park, Ickes said, and to deprive North Carolina of the same would be unjust. Additionally, he believed the North Carolina route would be more scenic and comfortable during summer months because of its higher elevation.

KEN TAYLOR



JAMES C. RYAN



I can attest that a bike rider can certainly appreciate cooler temperatures at those higher altitudes, but they may have been offset by the longer climbs. At Crabtree Falls campground where we spent one of our nights, I cooled off after the long ride by standing under the falls.

Of course, nobody was thinking about higher altitudes and natural showers for weary bikers in 1934, but there were other reasons Ickes chose the southern route. Fewer bridges would have to be built and the route through the Pisgah National Forest would eliminate approximately 50 miles of potential right-of-way difficulties. Washington already was pumping millions of Federal dollars into Tennessee's economy through the Tennessee Valley Authority. Lastly, the Tennessee route would bypass Asheville and Ickes had no desire to interfere with that city's long established tourist industry.

Once the major outline for the route had been decided, it became Abbott's job to fine-tune it, to fit it into the surrounding landscape in an appropriate way, and to locate suitable cultural and natural resources that travelers would enjoy.

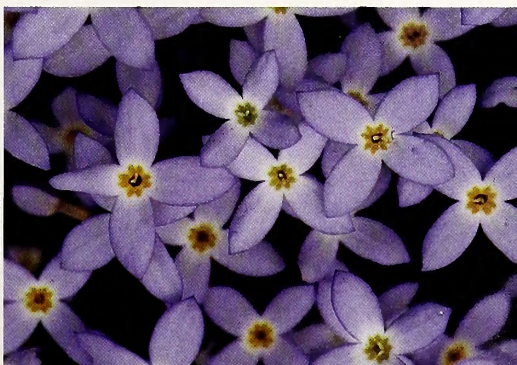
A bicycle rider is particularly aware of Abbott's conscious effort to provide a variety of "looks" for visitors to the Parkway. As expected, we saw many spectacular mountain vistas from high ridges, but we also constantly changed elevation, dipping into valleys past pastoral scenes of grazing cattle, split rail fences, old cabins and fields, then climbing back into high country. This strategy also offers opportunities to view the variety of plant and animal life that exists at different elevations. At one knob in the Balsam range, my dad saw a black bear — an enduring symbol of wilderness — yet we were frequently traveling through picturesque mountain farmland.

According to Dr. Harley Jolley, professor of History at Mars Hill College and a noted Parkway historian, this diversity was one of the assets of Abbott's most brilliant ideas — the use of scenic easements. Not only did these easements create a more interesting route, creating a feeling of grandeur and expanse, they also played a major role in gaining local support for the Parkway.

Landowners adjoining the Parkway were offered use of land within the Parkway's right-of-way and were encouraged to move their farming operations almost up to the roadbed. This arrangement was mutually beneficial. The Parkway achieved the visual variety it sought and the landowners were allowed to farm the Parkway's land almost rent free. In many instances, the Parkway even helped the landowners build fences and paid for conservation measures such as erosion control, fertilization and seeding.

One of Abbott's favorite sayings was that the Parkway stretched to the horizon. But at the time it was being built, that horizon was far from scenic. Ruthlessly exploited by

***Travelers who cruise** the 450-mile Parkway pass many old farms, pastures and cabins that look much the same as they did when these mountains were first settled (left). A 45-mile-per-hour speed limit invites visitors to stop and read historical markers or enjoy an intimate view of the region's countless wildflowers such as these bluets (below).*



MELISSA McGAW

KEN TAYLOR

***Jay Davies coasts** down the 20-mile stretch of Blue Ridge Parkway towards Asheville, the leg-killing uphills all behind him. More and more cyclists are discovering what may well be the nation's most beautiful highway.*

hungry timber and mining interests, much of the land was a seeping wound. Erosion was rampant, the forests were gone, the soil was depleted and streams were choked with sediment and debris.

Abbott knew mountain people were wary of outsiders, yet their cooperation was crucial if the scenic values he sought were ever to become a reality. Under his gentle guidance, the Parkway became a vehicle for winning the confidence of the people and educating them about conservation.

Those who accepted the scenic easements became, in effect, demonstration farmers, showing others that conservation could heal the scars and return the land to productivity.

Jolley also believes Abbott had a higher goal than building a beautiful Parkway. "He was building a community with a high quality of life," says Jolley. "From day one, Abbott was determined to get the conservation ethic across. Leave a little, share a little. Abbott got the people's trust. This was his great contribution."

The cultural resources contained within the Parkway are as much points of interest for the visitor as are its natural resources. Helping the public learn about and appreciate these resources is called interpretation. Mary Ann Peckham, the Parkway's interpretive specialist, believes the more the visitor sees, touches and feels, the better the interpretation will be.

We saw an example of this interpretation at the Brinegar Cabin which contains a quilt made by visitors to help celebrate the Parkway's 50th anniversary. Peckham likened the experience to the old quilting bees and said visitors developed a partial sense of what life was like in that cabin. Interpretation also occurs at visitor centers, contact areas and demonstration areas. Depending on the site, they offer a menu of recreational opportunities and services. Concessioners — private businesses that competitively contract with the Parkway — manage a number of these areas.

Biking along, we also frequently passed other interpretive messages, wayside exhibits with wood signs or aluminum easels. If you read these messages as you travel, you will learn a great deal about the history of the Southern Appalachians. If you attend informal campfire presentations at any of the nine Parkway campgrounds, you'll learn even more.

Abbott's dream began to become a reality when construction on the Parkway began September 11, 1935. Yet, it was not until September 11, 1987, that the motor road was completed. A 7.5 mile "missing link" around Grandfather Mountain delayed completion for nearly 20 years, while disputes raged over first the alignment and then construction techniques. Because of the area's sensitive ecology, a major bridge was recommended, but environmental protection did not come cheap. At a cost of roughly $10 million, the Linncove Viaduct is an engineering marvel, but it raises a question: could the Parkway be built today? Most likely not. A dozen years ago, there were plans to extend the Parkway into Georgia, but Jim Ryan, public affairs officer for the Parkway, recalls that comments at public hearings on the plans were overwhelmingly negative.

Professor Jolley and others believe the Parkway could only have been built at one place and time. "The need, the brains and the workforce," says Jolley, "all came together." Those ingredients, for various reasons, are not present today.

The Great Depression and President Roosevelt's determination to use the power and wealth of the Federal government to drive the country out of its economic quagmire produced, among other organizations, the Civilian Conservation Corps. The "CCC boys" provided the hand labor that was vitally necessary to beautify the Parkway after the bulldozers left. "The hands!" Jolley clasps his together to animate his words. "That massive labor force isn't there now."

Another vital ingredient lacking today is inexpensive land. Because of the view they provide, the ridges, worthless at the time the Parkway was conceived, now fetch top dollar. The 80,000 acres in the Parkway would be prohibitively expensive if purchased today.

And, of course, there would be the environmental considerations, and countless permits. For example, the headwaters of many trout streams were severely impacted by siltation as a result of the Parkway's construction, despite the care Abbott emphasized.

Although the dream of a Parkway stretching from Vermont to Georgia will never be realized, the Parkway may continue to improve. Gary Everhardt, the Parkway's sixth and present superintendent, sees a challenge. "The job is really just beginning," he says. "We think there are many other opportunities to enhance the Parkway's recreational investment."

One of those opportunities might be a Folk Music center tentatively planned for the Fisher Peak area on the Virginia-North Carolina state line. Traditional mountain music is faithfully perpetuated in this region, and Everhardt hopes the center will preserve and interpret that tradition for Parkway visitors and, on a broader scale, the nation.

Maintaining the road surface, the scalloped and grassed shoulders and the visitor facilities will be difficult — but possible — under tightening Federal purse strings, but Everhardt is less confident about another threat to the Parkway.

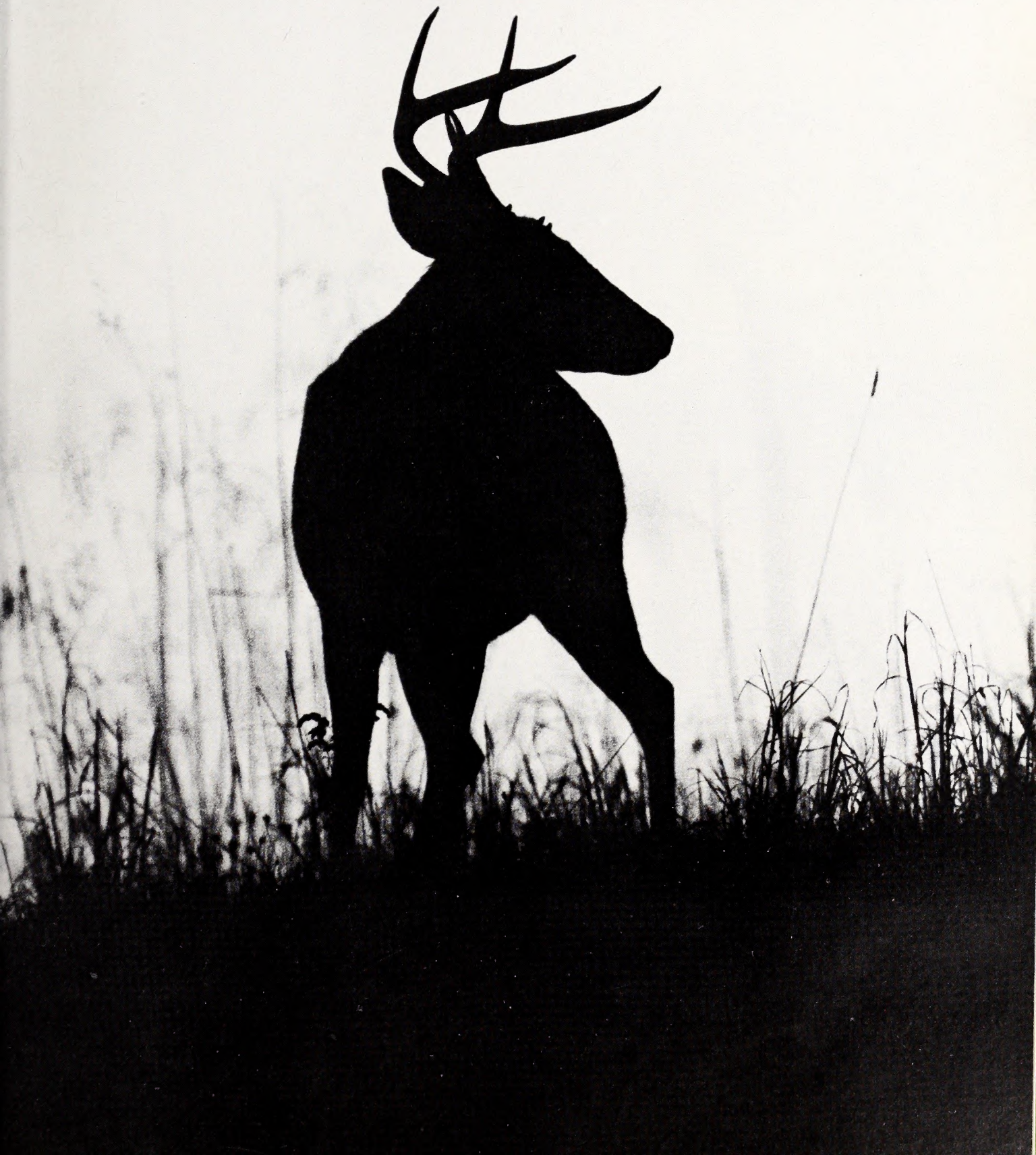
Abbott once described the Parkway as a painting on a 10-league canvas, for which a comet's tail was used for a brush. Today, however, more and more uncontrolled development, sprawling trailer parks, billboards and massive clearcuts slash across that canvas. If this continues, Everhardt warns, visitation probably will decrease and the resulting negative impact on state and local economies could be significant.

And yet, the Parkway still has great visual appeal. Keith and Faith Castillo of Lexington, N.C., recently spent their honeymoon driving the Parkway. "I've never seen the tops of mountains before," Faith said. "It was so beautiful, it made me cry."

Horizon to horizon, the Blue Ridge Parkway still has that overwhelming power, a monument to Abbott's vision, to the hard work of many others, and to a unique time in our history that made it possible.

Leaving Craggy Gardens, I began an exhilarating 20-mile downhill run into Asheville, and could reflect on the history I had learned and the scenic views I had enjoyed on my journey through these still handsome Southern highlands. But I had to admit that I had probably seen less of it on those long, exhausting uphill grades. I'll take a better look at those stretches this fall — by car. ☒

Hunting Seasons Roundup 1988-89



North Carolina Hunting Seasons 1988-89

Species	Hunting Season	Daily Limit	Possession	Season
Dove	Sept. 3-Oct. 8 Nov. 23-Nov. 26 Dec. 19-Jan. 7 Shooting hours are from one-half hour before sunrise until sunset.	15	30	None
Crow	Thurs., Fri., Sat. of each week from July 1 to Feb. 28 and from June 1 to June 30 plus Labor Day and Christmas Day		No restriction	
Deer				
Bow and Arrow	Sept. 12-Oct. 8 (*Eastern)	2	2	***4
	Sept. 12-Oct. 8 and Oct. 17-Nov. 19 (*Western, except Yancey County)	2	2	4
	Sept. 12-Nov. 5 (*Central)	2	2	4
	Sept. 12-Nov. 12 (Northwestern)	2	2	4
Muzzleloading	Oct. 10-Oct. 15 (*Eastern) Oct. 10-Oct. 15 (Western) Nov. 7-Nov. 12 (*Central) Nov. 14-Nov. 19 (Northwestern)			
Gun	Oct. 17-Jan. 2 (*Eastern) Nov. 14-Jan. 2 (*Central) Nov. 21-Dec. 3 (*Northwestern) Nov. 21-Dec. 10 (*Western)			
Gun Either Sex and Special Either Sex	See *1988-89 North Carolina Inland Fishing, Hunting and Trapping Regulations Digest*			
Black Bear	**Oct. 17-Nov. 19 and Dec. 12-Jan. 2	1	1	1

	**Nov. 14-Nov. 19 **Nov. 14-Nov. 16			
Wild Boar	Oct. 17-Nov. 19 and Dec. 12-Jan. 2	1	1	2
Gray Squirrel	Oct. 17-Jan. 31	****8	16	75
Fox Squirrel	Oct. 17-Dec. 31 (Only in 18 counties. Season closed elsewhere. See *Regulations Digest*)	****1	2	10
Quail	Nov. 19-Feb. 28	10	20	None
Ruffed Grouse	Oct. 17-Feb. 28	3	6	30
Raccoon and Opossum	**Oct. 17 (sunrise)-Jan. 31 **Oct. 24 (sunrise)-Feb. 28	No restriction on opossum. See *Regulations Digest* for bag limits on raccoon.		
Rabbit	Nov. 19-Feb. 28	5	10	75
Rabbit — Box Trapping	Nov. 19-Feb. 28			
Pheasant-Nonnative Male Pheasant Only	Nov. 19-Feb. 1	3	6	30
Woodcock	Nov. 19-Jan. 2	3	6	None
Bobcat	**Dec. 12-Jan. 31 **Dec. 12-Feb. 11	No restriction		
Fox	See *Regulations Digest*			
Groundhog	No closed season or bag limits.			
Wild Turkey Bearded Turkey Only	**April 8-May 6	1	2	2
Migratory Waterfowl	Unavailable at this time; Federal regulations may be obtained by contacting license agent or writing N.C. Wildlife Resources Commission after October 1, 1988.			

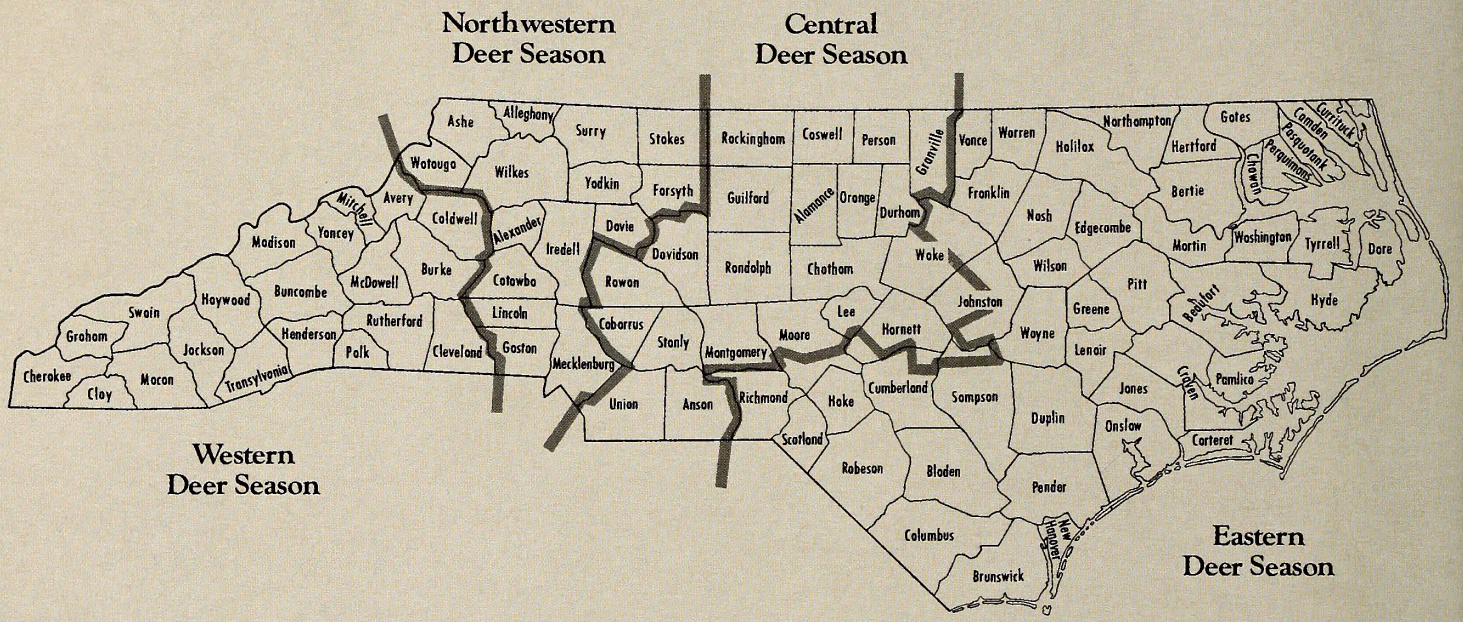
*See map on last page of this pull-out section for approximate boundaries of Eastern, Central, Northwestern and Western deer seasons; see *1988-89 North Carolina Inland Fishing, Hunting & Trapping Regulations Digest* for complete details. For a copy of the *Digest*, write: N.C. Wildlife Resources Commission, 512 N. Salisbury Street, Raleigh, N.C. 27611.

**Season varies from location to location; see *1988-89 Regulations Digest*.

***Eastern and Central limit is 4 deer. An additional antlerless deer may be taken during established either-sex season in some areas.

****Total limit of 8 squirrels per day of which one can be a fox squirrel.

Boundaries for North Carolina Deer Seasons



North Carolinians are blessed with good hunting. Deer, black bear, wild boar and wild turkey are all found here, and are considered big game. There is also excellent hunting for squirrel, rabbit, quail, dove and grouse.

Licenses. The first thing any hunter needs is a license, and the best buy for the all-around outdoorsman is the sportsman's license. This license includes all appropriate permits for hunting big and small game and fishing. For those who hunt only small game, a statewide hunting license may suffice. However, permits for big game hunting and primitive weapons must be bought separately.

Perhaps the best option for the serious outdoorsman is to buy a lifetime license. Five of these lifetime licenses are available — including the sportsman's license for adults, youths and infants, and lifetime hunting and fishing licenses. The sale of these licenses supports the Wildlife Endowment Fund, with only the annual interest being used for wildlife conservation. Eventually, the fund will play a major role in supporting wildlife conservation in North Carolina. Licenses are available from license agents across the state, and information on lifetime licenses is available from license agents, Wildlife Commission employees, or by writing the N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27611.

Game Lands. Finding a place to hunt is generally no problem. North Carolina has over 2 million acres of public hunting areas enrolled in its game-lands system. For the price of a game-lands use permit (which is included in the sportsman's license), sportsmen can hunt or fish on these public lands. Game lands are located throughout the state, and information is available free by writing: Game Lands Maps, N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27611.

Tagging Big Game. Big-game hunters should also be sure to tag and report all kills. Big game — which includes deer, black bear, wild turkey, and wild boar — must immediately be visibly tagged at the scene of the kill. These tags are provided when hunters purchase big-game permits or sportsman's licenses. Then, the hunter must report the kill to a nearby wildlife cooperator agent. There are over 1,500 wildlife cooperator agents located throughout the state — look for their diamond-shaped signs at country stores, sporting goods stores and other businesses. The cooperator agent will fill out a big-game kill report. A duplicate of this card is given to the hunter, and serves as a permit to possess the animal. Later, information from the big-game kill reports is used to determine harvests and other trends. Copies of the annual big-game harvest reports are available by writing to the Division of Wildlife Management, N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27611.

Hotline. Wildlife belongs to everyone, and if you observe people breaking wildlife regulations in the field, call the Wildlife Commission's toll-free Wildlife Watch Hotline at 1-800-662-7137.

City On A MILKWEED

***Common snail and** honeybees share a station on the populous milkweed plant.*

It's an ordinary wild plant, the milkweed, yet an astonishing diversity of life centers on it — all part of the intricate, connected web of nature.

written and photographed by Harry Ellis

Rising at the edge of a North Carolina meadow, the common milkweed plant *(Asclepias syriaca)* stood tall and majestic, almost as high as a man's head. I first came upon it and its immense insect population in the searing heat of a mid-July afternoon. Now in the midst of its flowering cycle, many rounded, ball-like clusters of pink and dull-purple florets hung from the axils of the broad, oblong leaves.

That day I became engrossed and fascinated while watching waves of insect life sweep across the leaves and blossoms. I had long been aware that the milkweed is host to an annual assemblage of insects and other forms of life, but I had never before paused to examine the significance of these relationships. Here was a veritable island of life, lifted above the daisy-filled meadow, a miniature ecosystem within itself. From that time on, for all the remaining days and weeks of that summer and autumn, I was a milkweed watcher, and with note-book and camera would

***Multi-eyed** nursery-web spider (above) totes its egg-sac across a milkweed leaf. This spider also built its web on the plant. Below, a milkweed seed sports its parachute plume. Milkweed, like other plants, has developed ways of dispersing its seed across the landscape.*

spend many hours observing this microcosm of life.

The milkweed has a transient and permanent fauna consisting of hundreds of diverse species, each with its own specific needs and goals. This is in contrast to an anthill or termite colony in which individuals exist, in a sense, as component parts of one huge, writhing organism or brain.

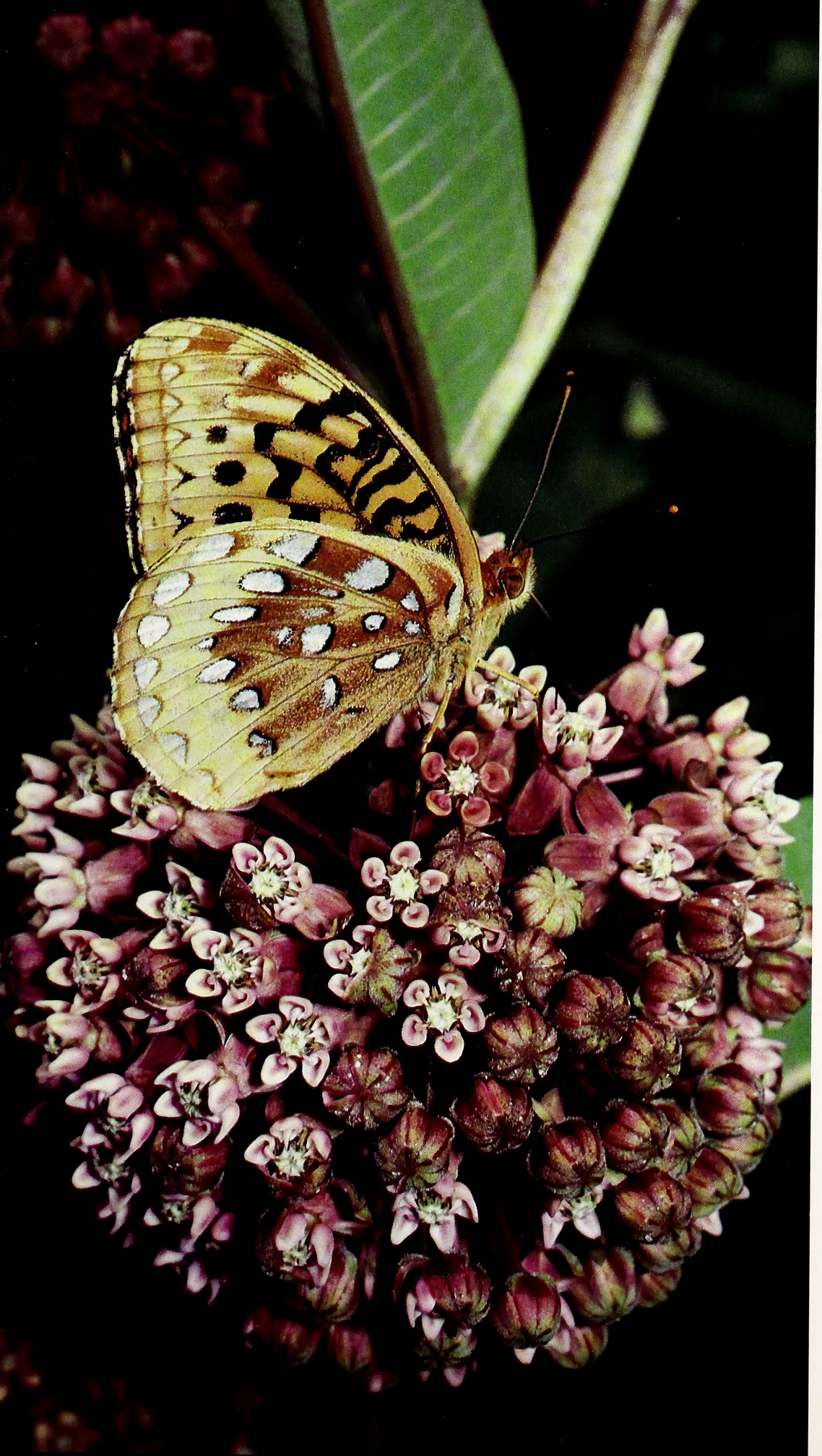
Activity at the milkweed is highest in early or mid-summer when its fragrant blossoms, heavy and sweet with nectar, attract many hundreds of insects, from butterflies and small moths to bees, beetles, flies, ants and almost every kind of flying, creeping, and crawling creature. In addition to the nectar-seekers, caterpillars and other insects feed on the leaves and aphids suck the juices. Others simply hide and make their homes among the sturdy, green leaves. This insect traffic always attracts the hungry predators — ambush bugs, praying mantises, robber flies, hunting wasps, and spiders of many species. Also, there are the scavengers that eat what the others leave behind, like the harvestmen or daddy longlegs, which also feed on aphids.

One day as I watched honeybees and bumblebees frantically working at the flowers, a large, hairy robber fly *(Laphria flanicollis)*, a bumblebee mimic, swooped down and captured one of the honeybees. It settled on a nearby leaf and, through its long, tubular beak, began sucking the juices from the honeybee's body. On one of the topmost leaves, a praying mantis stood motionless, with its forelegs folded like a monk in prayer, ready to lash out at some unwary insect with a lightning-bolt strike. While hummingbirds darted in and out among the flowers, a brown snail inched up the milkweed stalk and dragged itself across a leaf, leaving a trail of slime. Metallic-green bees flashed iridescent hues. The leaves teemed with leafhoppers and tiny beetles only about 2 millimeters in length. To such diminutive creatures, a milkweed leaf is a boundless universe.

I found two species of jumping spiders on the milkweed that day, creatures that can leap 40 times their own body length. There was a yellow crab spider with its prey — a spider of another species. I also discovered that a nursery-web spider *(Pisurina mira)* had constructed a web — really a nursery for its young — by weaving together milkweed leaves with those of a ragweed plant growing nearby, stretching it directly above a cluster of milkweed blossoms. A few days earlier, I had seen a spider of this species, probably the same individual, scurrying across a leaf carrying her egg-sac.

As if by a magnet, the monarch butterfly is drawn to the milkweed. Its larvae will eat nothing but milkweed leaves, and the female always lays her eggs on that plant. The newly hatched caterpillar has but one aim in life, to eat ravenously and almost continuously gorge itself. When its days of feeding come to an end — now a full grown 2-inch long caterpillar — it attaches itself, head downward, to a milkweed leaf or nearby twig, and within hours is transformed into a beautiful, gold-trimmed, green cask or chrysalis. Here, inside these jade-green walls, one of nature's great miracles quietly takes place. Through the marvels of metamorphosis comes an almost unbelievable transformation, where hideousness and repulsiveness are left behind, while the caterpillar's organs dissolve, melt away, and re-form, tissue by tissue, into a flame-colored winged beauty — the elegant monarch butterfly. The ugly caterpillar has literally been made anew — born again — with the newborn monarch butterfly possessing a complexity of migratory instincts that still represents one of the greatest riddles in the world of science.

Milkweed plants have devised strange and unique ways of making insects work for them. Of all the tactics adopted by flowering plants to ensure cross-pollination, the complex relationship between the common milkweed and insects are the most amazing. Milkweed pollen is not shed in fluffy, dust-like grains as in most plants, but is packaged in hard, wax-coated, multi-grained packets called *pollinia*. The milkweed floret consists of a central column, the stigma, surrounded by five incurving, fleshy, horn-like petals, heavily baited with nectar. Running ver-



A great spangled *fritillary* (Speyeria cybele) *alights on milkweed florets. This 3-inch butterfly is only one of many insects, permanent and transient, that colonize the milkweed plant. This butterfly is found in North Carolina from May until October.*

Like battleships passing *rowboats, milkweed bugs clamber past tiny yellow aphids on a milkweed pod. Aphids parasitize many plants and reproduce so fast that without predators they'd overrun the earth. Aphid lions, offspring of the green lacewing butterfly, eat aphids from morning to night.*

tically between each fleshy petal is a groove or slit that narrows from bottom to top somewhat like an inverted V. Attached to the top of each groove is a wishbone-like structure bearing two pollinia, one on each prong. When a bee or other insect walks across the flower, one or more of its feet often come to rest at the bottom of an inverted V-shaped slit. As it prepares to leave, its feet are pulled upward into the narrow section of the groove and held fast. Large insects can jerk hard enough to tear out the entire wishbone-shaped mechanism with its pairs of pollinia and escape. Bees, the chief pollinators, fly from blossom to blossom, often with pollinia swinging from their feet like miniature saddlebags. On the stigma of another flower, these pollinia are rubbed or broken off and fertilization is achieved. Without this act, no seed pods could develop and the milkweed would face extinction. The success of this ingenious scheme is attested to by the super-abundance of milkweed plants in the summer fields.

But for many thousands of insects not strong enough to extricate themselves from the grooves, milkweeds can become a death trap. Almost every time that I visited my milkweed in the meadow during the flowering season, I found a varied assortment of imprisoned flies, small moths, beetles, and bees that were either limp and dead or vainly struggling to escape. The majority of honeybees can pull free, but not always. Many were dead in the blossoms. I didn't see any trapped bumblebees, and so I assumed that they were strong enough to break loose.

The milkweed leaves were alive with aphids. I noticed a few on a leaf-tip and in less than a week they covered the whole leaf. Mass-produced by virgin birth through a process known as *parthenogenesis*, their prodigious numbers would overrun the earth were it not for vast hordes of natural aphid enemies. One of them, the lovely green lacewing, with its gauzy wings and golden eyes, lays her eggs on the milkweed. Her offspring are the voracious aphid lions, ugly creatures with sickle-like jaws that eat aphids from morning until night.

As no season lasts forever, the milkweed's blossoms eventually faded and died, and during ensuing days and weeks the lush green of the meadow grasses turned to varying shades of bronze and gold. With the departure of the nectar-seekers, the high tide of the insects was over, though activity at the milkweed remained reasonably intense, especially on days of fair weather and sunshine. Milkweed bugs (*Oncopeltus fasciatus*) came in great numbers to eat the seeds, red milkweed beetles (*Tetraopes tetraophthalmus*) were abundant on the foliage, and clusters of milkweed tiger moth caterpillars devoured the leaves.

The milkweed's pollination *mechanism proves fatal for many small insects, including this honeybee. Lured by nectar, the small bee was snared in the slits of the milkweed's flower and couldn't escape. A larger insect caught in the trap would have torn free, taking away the pollen packet that would pollinate the next milkweed. Crab spider (below) finishes off a rival spider on a milkweed leaf. The milkweed plant is a natural hunting ground for predatory insects.*

As a part of the south-flowing tide of fall migrants, monarch butterflies drifted over the September meadow, one passing me every few seconds, some flying in tandem. Out of the northeast they came, fanning directly southward toward their winter quarters in those distant Mexican highlands. Next spring a few battered wings would make their way north again, find fresh milkweed plants and begin the cycle anew.

In the golden sunshine of early October, insects appeared almost as abundant as ever, though on certain days and at night, there was a biting chill in the air. As the autumn days grew shorter, the milkweed leaves turned a dull, toasted yellow and the seed-pods browned, fat with ripened seeds.

Then came a day of piercing cold, a raw, wintry day, coldest of the autumn season. The winds, strong and gusty during the day, had calmed by sunset, with the temperature at 30 degrees F. By morning it had dropped to 20, with the still ponds rimmed in ice and a white, steely frost covering the fields and meadows. No insect could have escaped.

The teeming insect city that for many weeks had flourished like a fairy dance of life upon the milkweed, had been erased and blackened to dust by a single night of frost and cold. Extinction, however, came not before eggs were safely hidden away in secret nooks and crannies and the future of each species secured. But for all the vibrant, creeping, fluttering inhabitants, night had descended on the milkweed city. ⊠

RAMON BELL

I Shot The Record Buck

The biggest typical rack ever recorded in North Carolina was on a Piedmont whitetail that came calling at an unlikely time.

by Terry Daffron

I hunted 16 years before I killed my first buck. I had chances, of course. I also killed a few does, but no buck. All that changed on December 12, 1987, when all my wildest dreams came true — a day of seemingly impossible coincidences and unbelievable luck.

Throughout the season, I had been hunting on a Rockingham County farm owned by friends. That morning I decided just as I was out the kitchen door that I would stay and hunt near my home in Guilford County.

I had spent numerous Sunday afternoons scouting for signs of scrapes, rubs, and trails on land that has been in my family for generations. I had selected a stand about 250 yards from some good scrapes and about the same distance from several rubs. There were numerous good trails in that area, and I had often spotted does. It seemed, in fact, that nearly everyone except me had seen bucks in this vicinity. Even though I had never seen the bucks, I was sure they were in there.

I had to pause at the edge of the woods until it was light enough to see without a flashlight. When I reached my pre-selected spot, I set out some Tinks 69. I use a film canister with cotton balls, setting the cotton balls out all around the area of the tree stand. Then I got into my self-climbing stand and up I went, retrieving my rifle with a rope.

By 8 o'clock that morning, I was debating whether to tough it out or go home when I heard something approaching from a distance. There was movement in the leaves. When I heard twigs snap, I saw her — a beautiful doe headed straight for my tree stand. Following closely behind was her hopeful suitor. She walked directly to the tree where I was perched, and stopped. The buck, a nice 8-pointer, stopped about 50 feet broadside to me. He was grunting, sniffing, and stomping the ground. I had never heard a buck grunt before. I lined up the crosshairs in just the right spot, squeezed off my first shot, and the buck fell in his tracks.

Surprisingly, the doe ran off about only 50 yards, so I waited another 15 minutes, then climbed down. Even as I approached the buck, the doe remained perhaps 75 yards away. I decided not to field dress the buck — he was a nice-sized deer — because I wanted to get his live weight. I tied a rope around his antlers thinking that if I could drag him to the old woods road 100 yards away, I could then use my tractor to haul him to the house.

I was packing up my tree stand when I heard something crashing through the thicket 50 yards from me. Although I really did not expect to see another deer, I reached for my rifle just in case. When I looked up, my knees went weak! There, just over 30 yards away, was a huge buck with the widest rack I had ever seen. I could easily see his head and antlers but his body was behind some brush that prevented me from getting off a clean shot. I tried to keep my knees from buckling as I watched him sniff the air and stomp his feet. Finally, he moved into an opening. I eased my rifle onto my shoulder and realized as I tried to line up the shot that the caps were still on the scope (I don't have see-through mounts). The big buck was still sniffing and stomping his feet, and never so much as looked towards me. I decided it was now or never, so I pushed the button for the caps to flip knowing there would be an audible click. The click did not appear to bother him, but before I could shoot, he again stepped behind some brush. Now I was playing the waiting game once more. When he suddenly stepped into another opening, I squeezed off a shot. He did a perfect 180-degree turn and ran off. There was no chance for a second shot, but I fully expected to see him drop because I knew I had made a good hit. He had run off to my right, and I marked in my mind's eye a tree he passed as he disappeared into the woods beyond.

I waited about 20 minutes before walking to the spot where he had stood when I shot at him, but there was no blood or hair. I refused to believe I had missed a deer at 30 yards. I followed his tracks through the low bottomland, and still found no signs of blood. I entered the thicket at the tree I had visually marked and made small circles searching for signs of his trail. I must have covered three or four acres, but found nothing. There was a creek nearby, so I decided to walk the creek thinking he might have crossed it. The creek was wide with high banks, so if he had crossed it, I would know. I walked the creek for about 150 yards without finding any signs at all. Feeling sicker by the minute, I returned to the spot when I had shot him and started the search again. After nearly four hours, I decided I had to take care of the 8-pointer and return later to continue the search.

The 8-pointer was nothing to sneeze at! He weighed in at 165 pounds (live weight). By the time I finished with him, it was almost nightfall. I had no choice but to wait until the next day to resume the search. That night was an extremely long one.

When morning finally came, I headed back to the woods and resumed the search trying to cover more territory this time. After nearly two hours, things were looking pretty dim. I decided that even though the buck had run off to the right, I was going to search for him in the opposite direction. I returned once more to the spot where I had shot my missing trophy. Heading off to the left this time, I had walked only 50 yards when I saw the wide set of antlers on the ground. The closer I got, the more amazed I became. There was no blood trail leading to him, and he had apparently made a circle, almost returning to the exact place where he had been shot.

The deer, a 10-pointer, weighed in at 230 pounds, and my hunting buddy, Charlie McClintock, helped me get the deer ready for the trip to the taxidermist. Of course, we made several interim stops to show off, and one admiring hunter said he had just seen the state record Boone and Crockett buck a couple of weeks before and mine had it beat. When we arrived at taxidermist David Handy's place, he said he had never seen a bigger buck in North Carolina.

After the deer was mounted, we waited for the required 60-day drying period to elapse. The deer was officially scored by Mike Seamster from Caswell County who is an official Boone and Crockett scorer. Mike was assisted by Harlan Hall of Burlington, who is also an official B&C scorer. Harlan is also supervising biologist for the N.C. Wildlife Resources Commission's 5th district, and Mike is the agency's wild turkey project leader. They scored my buck at 181⅞ths points — a new North Carolina state record!

Sixteen years is a long time to wait for the harvest of a whitetail buck, but every time I look at that impressive rack on the den wall, I know the wait was worth it. ⚀

ZOE LUCAS

***A discarded plastic** six-pack holder slowly strangled this sea bird.*

A Sixpack Of Problems

Discarded plastic and other forms of litter are killing wildlife, especially on our beaches. But there's something you can do about it.

by Sarah Friday

Along the edge of the sea, a tangle of fishing line caught the oyster catcher's eye. As it probed its long bill into the sand, the bird gradually wound the plastic line tighter and tighter around its legs. Eventually the bird could neither walk nor fly. But it didn't die all at once. For days the twisted mesh held it captive and by the time the park ranger found it, the beautifully colored bird had starved to death.

The scene occurred in Ocracoke last year, but it is repeated all along North Carolina's coast with scores of other birds. Sea gulls, loons, pelicans and shore birds frequently get caught in discarded monofilament line. Sea turtles, fish and other marine animals fall victim to plastic litter, too. They get tangled in fishing nets or stuck in six-pack rings. They mistake plastic bags for jellyfish or pieces of Styrofoam as food.

The result is almost always the same. The plastic kills.

Orphan plastic litter plagues most of North Carolina's beaches, lakes and waterways, and the problem is getting worse. Plastic production has proliferated since World War II when shortages of natural resources created a demand for the tough, man-made material. Now, more than 47.9 billion pounds are produced annually with each piece lasting up to 450 years. That means one six-pack ring has the potential to kill over and over again.

But the problem is not how much plastic we produce or use; it's how we dispose of it. The U.S. Coast Guard estimates that recreational boaters generate about 34,000 metric tons of garbage per day, or about a pound per person. A good portion of that ends up in the water. Merchant ships dump about 6.6 million tons of trash overboard every year, reports the National Academy of Sciences. Commercial fishermen lose or discard tons of fishing gear yearly. And careless beachgoers add to the daily debris by leaving behind Styrofoam cups, sandwich bags, fast food containers and other trash.

"The problem of plastics has reached very visible proportions," says Lundie Spence, Sea Grant's marine education specialist. "The proliferation is a visible indicator of how little many of us care about our total environment."

But last summer, Spence and representatives from three other state agencies devised

WILMINGTON STAR NEWS

***These boys were** among 1,000 volunteers who scoured North Carolina beaches for litter in September 1987 during the first annual Beach Sweep. More than 33,000 bags of plastic products, glass, metal and other trash were collected from the ocean fringe.*

a plan to change that. Along with Sea Grant, the Office of Marine Affairs and the divisions of Coastal Management and Parks and Recreation organized the state's first coast-wide cleanup. On Sept. 19, more than 1,000 people came to the coast for Beach Sweep '87. Volunteers scoured 150 miles of beach from Nags Head to Masonboro Island and along inland sounds. And in three hours they collected more than 14 tons of trash and recorded each piece on data cards.

Most participants were amazed at how much litter they found during Beach Sweep. The rest of North Carolina was, too, when the final counts came in. Plastics topped the list as the largest of seven categories. Altogether, volunteers picked up 33,375 bags, bottles, diapers, egg cartons, fishing nets and toys. In the second largest category there were 18,597 Styrofoam items such as buoys, cups and fast food containers. Metal pieces — cans, wire and bottle caps — ranked third with 13,448. Tallies of other categories included: paper — 10,090; glass — 7,971; wood — 3,372; and rubber — 787.

A thorough analysis of the data has not been completed. But most of it is what Spence calls "recreational garbage" from boaters, campers, beachgoers and anglers. She wants to take the word on beach litter to these groups to heighten awareness of its problems. And she and other Beach Sweep organizers are encouraging everyone to join in Beach Sweep '88 on Sept. 24.

North Carolina's cleanup efforts are part of a national movement focusing on debris and its effect on marine wildlife. The campaign has been smoldering for about 10 years, but the fire has ignited and is beginning to spread.

"The awareness has really changed in the past two years," says Kathy O'Hara, a marine biologist with the Center for Environmental Education. "It's changed from a 'We're not the problem' attitude to one of 'OK, we're part of it. What can we do about it?' " O'Hara says.

Last year, 19 states sponsored beach cleanups. The U.S. Navy is taking steps to minimize the amount of non-biodegradable trash generated at sea, and researchers are looking for ways to make plastics break down faster than they do now.

Last year, Congress felt the heat, too, passing legislation that prohibited dumping plastics within the United States' 200 miles of territorial waters and in all inland navigable waters. At the same time President Ronald Reagan signed this bill and made it law, he approved the United States' part of an international provision prohibiting ocean dumping of plastics. The provision, Annex 5 of the MARPOL (Marine Pollution) Treaty, takes effect this December.

O'Hara believes the new litter laws will prompt coastal states to tighten enforcement within their jurisdictions. But ultimately, it will take all of us to keep the coast clear. ⊠

Joining The Sweep

BEACH SWEEP '88 is Sept. 24, from 9 a.m. to 1 p.m. To volunteer, call the regional coordinator in the area where you would like to help.

Northern Coast — Rich Novak, UNC Sea Grant, Manteo, (919) 473-3937.

Middle Coast — Diane Warrender, Keep America Beautiful, Beaufort, (919) 728-8595. Joanne Braun, N.C. Aquarium, Pine Knoll Shores, (919) 247-4003.

Southern Coast — Andy Wood, N.C. Aquarium, Fort Fisher, (919) 458-7852.

Coordinating groups for BEACH SWEEP '88 include UNC Sea Grant, N.C. Division of Coastal Management, N.C. Division of Parks and Recreation, N.C. Office of Marine Affairs/N.C. Aquariums, and N.C. 4-H.

Three Active Nests Found This Year

More Bald Eagles Nesting Along Carolina Coast

Written and Edited by Mark Taylor

It's not unusual to see birds near the Wildlife Commmission's New Bern depot. However, coastal nongame project leader Tom Henson was surprised by two large birds that soared overhead one day last June — mature and immature bald eagles.

"I'd been surprised to see two bald eagles at Harkers Island only a few days before," Henson recalled. "Bald eagles are beginning to show up regularly in areas where they've not been seen for a long time."

The increase in bald eagle sightings here reflects a national trend for these endangered birds. In North Carolina, eagles had disappeared from the state by the 1960s, and were absent for nearly 20 years.

"We've seen a gradual increase in nesting over the past four years," said Henson. "The first active nest was found in 1984, and that nest was also used the following year. There were two nests in 1986 and 1987, and we found three nests this year in Beaufort, Hyde and Washington counties. There may also be an active nest in the southeastern portion of the state, but it hasn't been confirmed.

"Unfortunately, the three nests produced only one eaglet. Two of the nests were severely damaged last April by a strong Northeaster."

Henson adds that all of the nests are located in dense pocosins, which makes it difficult to determine if the nesting birds are those that have been released in past years at Lake Mattamuskeet. In 1983, the Wildlife Commission began its bald eagle project at the refuge—releasing juvenile birds which biologists hoped would return to the state as adults and establish a permanent nesting population.

"We've tried to reach the nests, but the vegetation is so thick you can barely see the sky let alone the birds," said Henson. "That's probably just as well, however, because the eagles are well protected."

Over 100 Artists Featured

Big Wildlife Show Slated In New Bern

North Carolina sportsmen will have the opportunity to see some outstanding wildlife art at the first North Carolina Wildlife and Sportsman's Show in New Bern. The event is being held on September 17-18.

"We're trying to put together a show similar to the big wildlife art shows in Easton, Maryland or Charleston," said Steve Harvey, chairman of the show. "North Carolina has outstanding hunting and fishing, and we want our sportsmen to be able to enjoy the top-rate wildlife art found at the bigger shows."

Over 100 artists — including painters, carvers and sculptors — will be exhibiting their work at the show, and Bob Timberlake's well known painting, Knott's Island Decoys, will be displayed. Collections of antique decoys and other hunting and fishing memorabilia will be also featured, and there will be numerous displays concerning wildlife conservation.

Proceeds from the show will benefit Ducks Unlimited, the N.C. Wildlife Federation, and Keep America Beautiful. For more information write the New Bern Chamber of Commerce, P.O. Drawer C, New Bern, N.C. 28560.

103-Pounder Hits Blue

Pier Fisherman Takes Record Cobia

RICK SMITH

Record Cobia: *Tony Moore of Emerald Isle recently fought this 103-pound cobia for over three hours before landing it to break the state all-tackle record of 97 pounds set in 1952.*

"I was fishing for kings off the Emerald Isle pier using a good-sized blue for bait," he said. "After the cobia hit, it ran out about 500 yards of line. The fish didn't jump, but just ran deep and hard. I was worried that he might run out all my line, then he turned and began swimming from side to side. I worked him back to the pier, and then I just about lost him. He wrapped around a piling, but before he cut off three other fishermen managed to get gaffs into him. It was a struggle all the way."

Moore is retired, and fishes five days a week from the Emerald Isle Pier. He has caught a number of big fish including a 64-pound citation cobia and a 97-pound tarpon.

Anglers Look For The "Breaks"

Fall Fishing For White Bass Great In Mountain Lakes

The arrival of cool weather later this month usually brings white bass up from the depths of our mountain lakes, and fishing for these schooling fish is popular on several reservoirs.

"Local anglers call this 'fishing the breaks,' " said Bennett Wynne of Canton, the Wildlife Commission's District 9 fisheries biologist. "White bass are open-water, schooling fish like striped bass, and feed heavily on threadfin shad. The cooler weather brings schools of shad and white bass to the surface. Fishermen cruise the lakes looking for 'breaks' or disturbances on the surface of the water — it's not much different from spotting a school of bluefish offshore at the coast except the breaks are smaller and there are no gulls."

There are no particular patterns to these breaks; therefore, most anglers cruise the lakes until they spot a break, then cast to the schooling white bass with shad-colored plugs or spinners. Some fishermen use deep-diving plugs to fish for largemouth and smallmouth bass beneath the breaks.

The best fishing for white bass is found in lakes Fontana, Hiwassee and Chatuge. White bass usually average a pound or so in weight, but 3-pounders are not uncommon. Fontana generally produces the largest fish.

"Fishing for white bass tends to be feast or famine," said Wynne. "If you find a break, you'll do real well. The fish can be anywhere, so most anglers just cover a lot of water and keep their eyes open."

MARK TAYLOR

Fall Catch: *White bass offer exciting sport on mountain lakes in the fall. The fish feed on schools of shad at the surface, and anglers look for ripples or 'breaks' in the water.*

Field Notes

Season openings, closings, and regulation changes:

Rails, Moorhens and Gallinules	Sept. 3-Nov. 11
Mourning Doves	Sept. 3-Oct. 8 (all day) Nov. 23-Nov. 26 (all day) Dec. 19-Jan. 7 (all day)
Eastern bow and arrow deer season	Sept. 12-Oct. 8
Central bow and arrow deer season	Sept. 12-Nov. 5
Northwestern bow and arrow deer season	Sept. 12-Nov. 12
Western bow and arrow deer season	Sept. 12-Oct. 8 Oct. 17-Nov. 19

Detailed information on bag limits and other regulations is found in the 1988-89 *North Carolina Inland Fishing, Hunting and Trapping Regulations Digest*, which is available from license agents. Information on waterfowl seasons may also be obtained from license agents.

Calendar of Events

September 5
Annual Labor Day Open House at the North Carolina Botanical Garden at Chapel Hill. Special exhibits, programs and tours dealing with our native plants.

September 10-18
12th annual French Broad River Week in Buncombe, Madison, Henderson and Transylvania counties. River cleanups, float trips, hikes, exhibits and festival. For more information contact the Land-of-Sky Regional Council, 25 Heritage Drive, Asheville, N.C. 28806.

September 14-16
Southeast Raptor Management Symposium and Workshop at Virginia Polytechnic Institute in Blacksburg, Virginia. Sessions will focus on management and protection of raptors. For more information contact the Institute for Wildlife Research, National Wildlife Federation, 1400 Sixteenth St., Washington, D.C. 20036.

September 29-October 1
10th annual U.S. Open King Mackerel Tournament at Southport. For more information contact the Southport Chamber of Commerce, Rt. 5, Box 52, Southport, N.C. 28461.

October 1
Second Annual Simmons Sea Skiff Day at the New Hanover County Museum in Wilmington. Displays of 15 sea skiffs which were developed and built by T.N. Simmons and his son at their boat shop on Myrtle Grove Sound near Wilmington from the 1950s through the early 1970s. The museum also offers plans and building directions for this interesting boat.

Conservation Zoning Applied

Natural Resources Preserved In New Hanover

Dear *Wildlife*:

"*Wildlife in North Carolina*" is an excellent natural resource magazine, not only for its wildlife articles, photography, and artwork, but also for its effective promotion of the conservation of North Carolina's natural resources. The article, "Before the Bulldozers" (April 1988), demonstrates this conservation effort in the description of Durham County's Inventory of Natural and Cultural Resources and Durham's ongoing attempts to implement its conservation programs.

To set the record straight, however, New Hanover County has performed an equally impressive county-wide inventory and, more important, has actually implemented the conservation of its significant natural resources through the adoption in 1984 of a zoning overlay district, known as the Conservation Overlay District (COD). The COD requires preservation of significant resources by developers in three ways.

1) Preservation of up to 100% of the resource area.
2) Fairly stringent stormwater runoff controls.
3) Setbacks of up to 100 feet from the resource.

The planning process which culminated in the adoption of the COD, involved a number of key steps:

Inventory of conservation resources — A consulting ecologist performed a detailed survey of the county that resulted in the mapping of significant resources (e.g. swamp forests, salt marshes, pocosins, significant natural areas). In addition, the county obtained an existing survey of several hundred archaeological sites from the state for inclusion in the COD.

Public participation — The Planning Department brought the Planning Board and Board of Commissioners together for a workshop which, first, educated them in the significance of the resources and, two, joined them in a consensus on the relative values of the resources.

The county was awarded the 1985 Outstanding Planning Award from the N.C. Chapter of the American Planning Association and, in part, the 1985 Outstanding Community Award from the N.C. Coastal Resources Commission as a result of the county's conservation planning process and adoption of the COD.

— *Dexter L. Hayes,*
Planning Director,
New Hanover County

Bottomland Print Offered

Proceeds from the sale of these prints will be placed in the Nongame and Endangered Wildlife Fund which supports a variety of nongame wildlife projects and the purchase of wildlife habitat in North Carolina. Each poster-sized, numbered print bears the North Carolina State seal, Governor Martin's signature, and the artist's signature.

Please send me _____
1987 Nongame and
Endangered Wildlife
Prints @ $25.00 each $_____

Enclosed is my
check for ..... Total $_____

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Stir-Fry Doves With Veggies

Most dove recipes have one fatal flaw — they begin with the words "Take a limit of doves...." If your eyes or reflexes aren't what they used to be, or never were, you'll like this recipe for stir-fried doves. Only a few dove breasts will fill out a small stir fry, and chicken may always be added as an extender if the hunting was slow.

Stir Fried Doves

Several dove and/or chicken breasts
2 onions
green pepper
head of broccoli
cauliflower
mushrooms
frozen or fresh snow peas (option)
1 tomato
soy sauce
mustard (Dijon or other good quality)
honey

Chop vegetables beforehand. In a hot skillet, brown pieces of dove or chicken breast and set aside. Add more oil, and stir fry vegetables until lightly cooked. Add dove breasts and small amount of soy sauce, and mix in about 4 tablespoons of honey and 2 tablespoons of mustard (amounts of ingredients aren't critical, and add to taste). Cover and cook until done. Serve over rice with salad.

— *Mark Taylor*

Atlantic Beach To Host

Conservation Retreat Slated

Looking for a chance to go to the beach? If so, consider attending the North Carolina Wildlife Federation's annual Fall Conservation Retreat at Atlantic Beach on October 6-9.

The retreat will include programs and hands-on experience in surf fishing, coastal ecology, marsh walks, an offshore collecting trip, and other events. A special program is also available for children.

Registration is $35 for adults and $10 for kids. Information is available from the N.C. Wildlife Federation, 1024 Washington St., Raleigh, N.C. 27605.

National Hunting And Fishing Day

Sportsmen Honored For Conservation Achievements

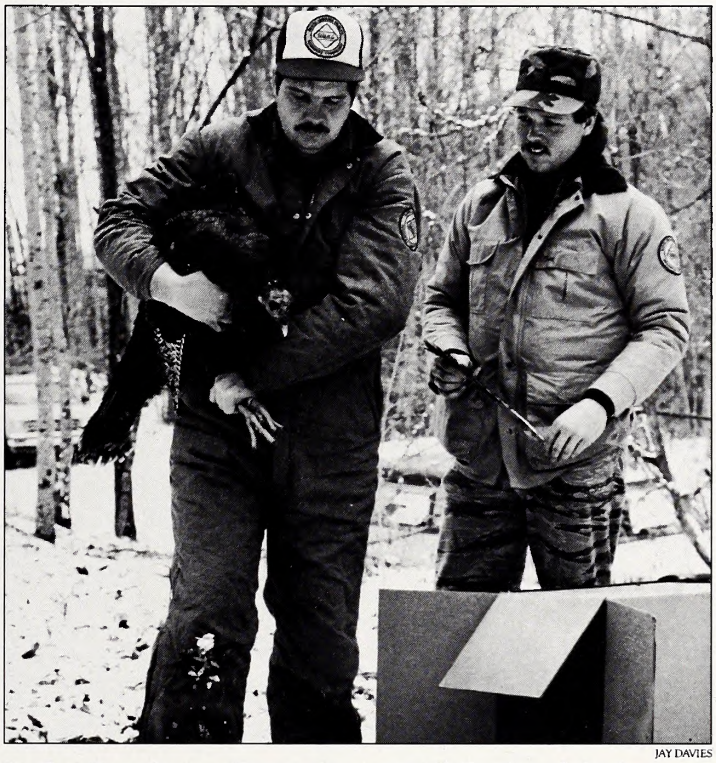
Hunters and fishermen will be honored for their contributions to wildlife conservation on Saturday, September 25, which is National Hunting and Fishing Day in North Carolina.

Over the past 60 years, sportsmen have contributed over $5 billion in license fees and special taxes to wildlife conservation. For example, sales of federal duck stamps — largely to waterfowl hunters — have enabled the U.S. Fish and Wildlife Service to establish over 400 national wildlife refuges in 41 states. These refuges harbor many species of non-game wildlife in addition to waterfowl, and offer excellent bird-watching.

Many wildlife species that we consider common were rare 50 years ago, and have been restored by state wildlife agencies using funds from the sale of hunting and fishing licenses. In 1900, the nation's white-tailed deer population was estimated at about 500,000 animals. Today, there are about 12 million white-tailed deer nationally.

A similar situation exists with the wild turkey. Turkeys had disappeared from most states by the turn of the century, and may have been reduced to about 650,000 birds. Currently, wild turkeys have been restored to 41 states, and the population is estimated at about 2 million birds. In most states — including North Carolina — wild turkey populations continue to grow as restoration projects continue.

Many wildlife clubs will be hosting National Hunting and Fishing Day events. Watch for details in your local newspaper.



JAY DAVIES

Turkey Populations Grow: *Sportsmen's dollars have helped support the restoration of many wildlife species, such as the wild turkey. Fifty years ago the wily birds had all but disappeared. Wild turkeys have now been restored to 41 states, and populations continue to grow.*

Greenville Firm Promotes Safety

A Greenville business was recently honored for its contributions to boating safety. Overton's Inc., one of the nation's largest mail order houses dealing in boating supplies, was recognized by the National Association of State Boating Law Administrators for its promotion of safe boating through the company's commercials and publications.

Overton's catalogue, for example, includes extensive information on the selection and use of personal flotation devices, and its radio advertisements urge boaters to boat safely and refrain from using alcohol on the water.

"We appreciate the efforts that Overton's has made to promote boating safety," said Colonel Harold Ragland, chief of the Wildlife Commission's Division of Enforcement. "Their ads offer simple, common sense advice on how to have a good, safe time on the water."

— *Angela Hill*

The Wildlife Endowment Fund Report

The Wildlife Endowment Fund is supported by the sale of lifetime licenses, lifetime subscriptions to *Wildlife in North Carolina*, and tax-deductible contributions. Only the annual interest from this fund is used for wildlife conservation, and the fund will play a key role in supporting wildlife programs in the future. Interest is earned through investments made by the State Treasurer's Office. For more information, write to the Wildlife Endowment Fund, N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27611.

Status on June 30, 1988

	Numbers Sold	Revenue Received
Lifetime Sportsman's License	44,720	$14,612,985.18
Lifetime Hunting License	314	78,392.08
Lifetime Fishing License	3,434	664,559.13
Lifetime Subscriptions to Wildlife in N.C.	1,340	177,595.02
Contributions	—	113,654.31
Fund Total		$15,647,185.72
Total Interest Earned	$3,052,858.83	

He Cleaned 'Em Out

Kid's Exaggeration Proves Truthful

Fishermen are notorious liars, but sometimes their exaggerations are closer to the truth than they think.

A few years ago, two trout fishermen in the mountains decided their favorite stream was fished out and needed restocking. It was just a narrow, "step across" creek tucked back in a mountain cove, and the 500 rainbow trout fingerlings which they bought and scattered through it one Saturday promised to provide great fishing in a year or two. Such was their plan.

Time passed, and eventually the men figured it was time to sample the fruits of their labors. It was a beautiful day, and they were limbering up their rods in anticipation when a young boy came walking down the creek. A big smile was spread across his face, and a stringer of fat rainbow trout dangled by his side. The two men greeted him, obviously pleased that their efforts had provided the boy with such enjoyable fishing. They were not greedy men, and after all they had stocked enough fish to go around.

"You done all right," they congratulated him.

"Yes sir," piped up the boy, "This creek's full of fish. Why I must have caught 500 here."

The two men looked at each other, and slowly shook their heads. "Yep," said one weakly, "I'd guess that's just about right."

— *Jay Davies*

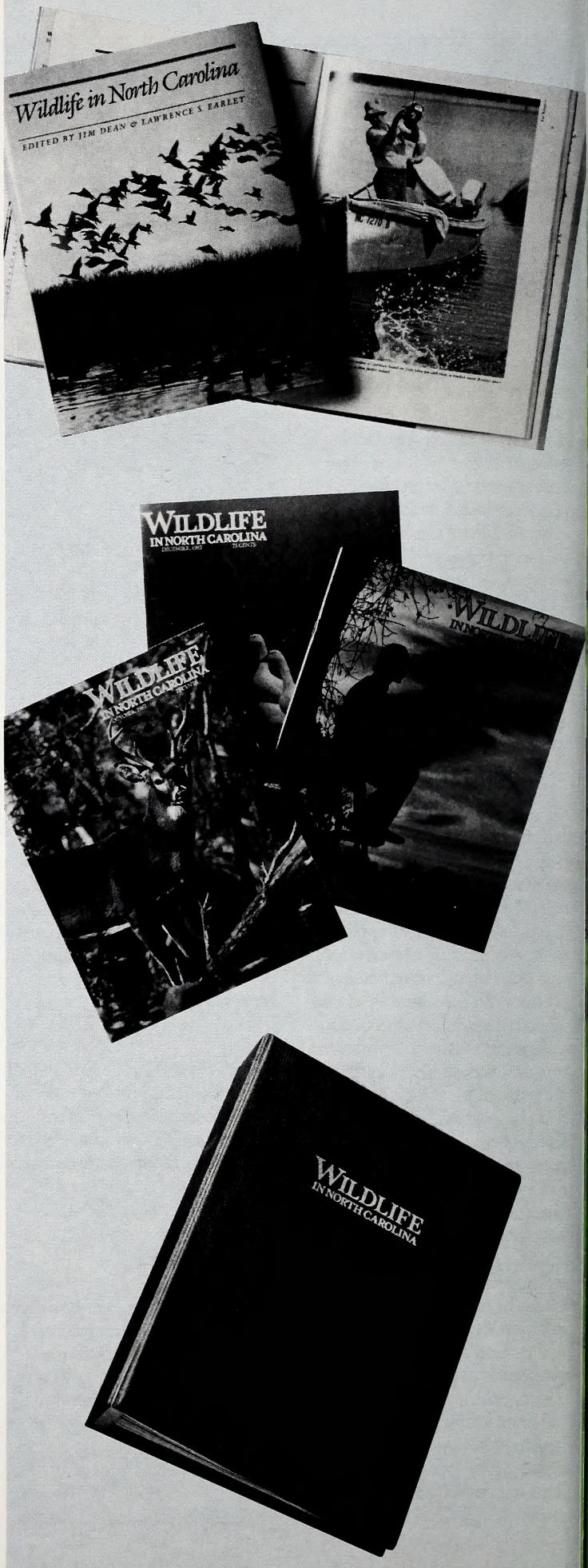
Everyone's talking about
Wildlife in North Carolina . . .
the book!

"This attractive book is probably intended for the sports or outdoors person; but in fact it should appeal to anyone with an active interest in our state's history, natural or otherwise."
— Michael McFee, *The Spectator*

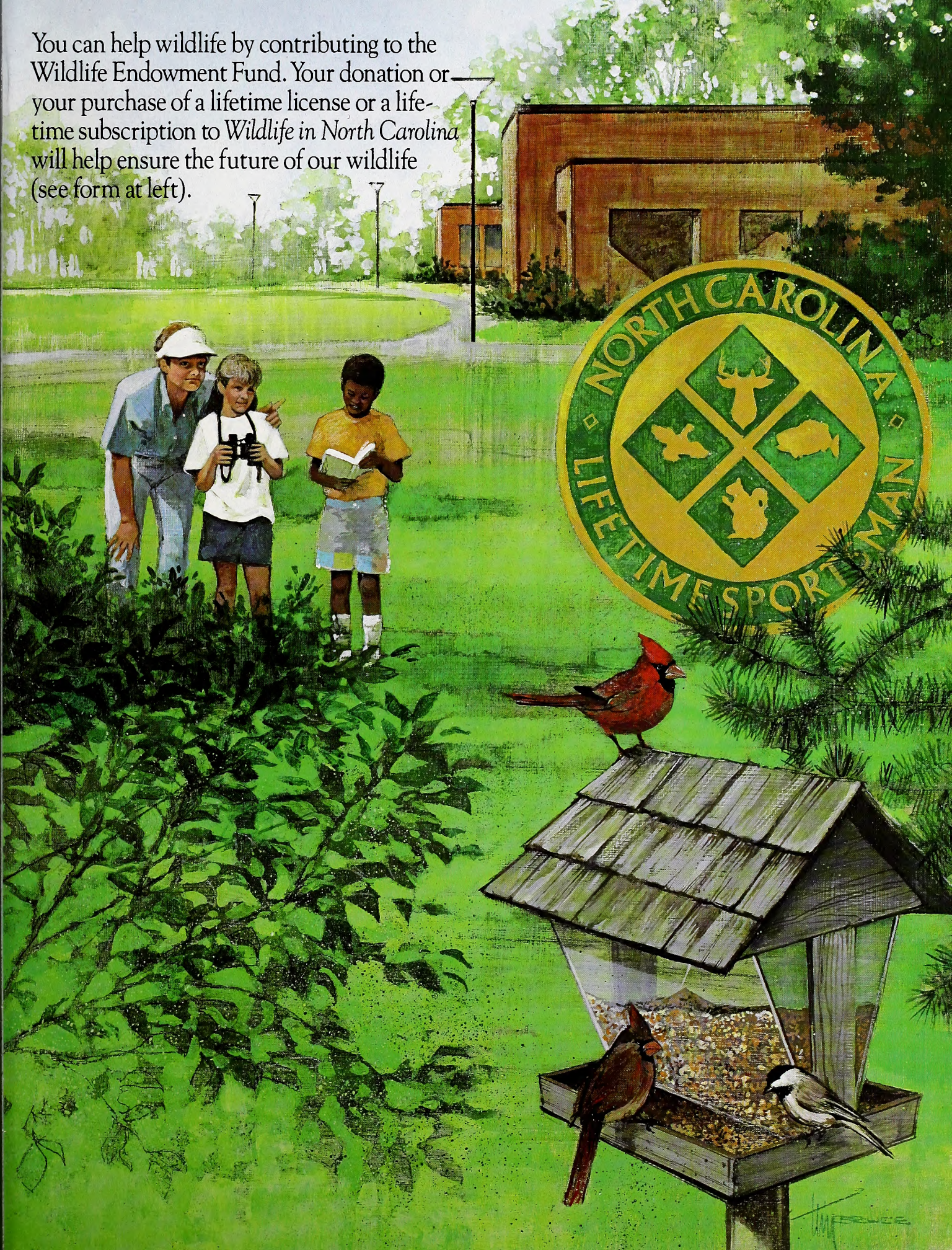
"This book . . . is a fitting commemoration of the magazine's 50th anniversary. The book's four sections reflect the emphases seen each month, as the magazine seeks to interest nature lovers and environmentalists as well as the serious hunters and fishermen . . . ."
— Linda Brinson, Winston-Salem *Journal*

"It is not only for the sportsman in the family but for all the family and an excellent book to send both to Tar Heels who have moved away and to folks who have just moved into North Carolina . . . . The only fault I find with *Wildlife in North Carolina* is that it is not long enough."
— Bugs Barringer, Raleigh *News and Observer*

Published by the N.C. Wildlife Resources Commission and the University of North Carolina Press. Hardbound copy is $24.95 at your local bookstores. Or order direct using the special order form on the opposite page.



You can help wildlife by contributing to the Wildlife Endowment Fund. Your donation or your purchase of a lifetime license or a lifetime subscription to *Wildlife in North Carolina* will help ensure the future of our wildlife (see form at left).



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Buck On Break

A whitetail is a bundle of nerves most of the time, but this buck has found a moment to relax in a wooded mountain cove.

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WILDLIFE IN NORTH CAROLINA

OCTOBER, 1988 75 CENTS

Whitetails And Ivorybills

by Jim Dean

Not many books have been written about deer hunting—perhaps none that rate as literature. Even if you include all types of hunting, you still wind up with only a few exceptional pieces of writing.

William Faulkner was an experienced hunter, and captured the almost spiritual quality of hunting in several stories, especially "The Old People" and "The Bear." Ernest Hemingway was also an accomplished hunter, and his African books are considered classics despite the attacks of critics. Robert Ruark was very readable, particularly the autobiographical recollections of his grandfather, but he feared unfavorable comparison to Hemingway, and rightly so. But who else? Much of what's left falls into the category of "how-to" or just plain mediocre writing.

LEONARD LEE RUE III

James Kilgo's first book, *Deep Enough For Ivorybills*, contains a lot of deer hunting, and since it's neither "how-to" nor mediocre, that alone puts it in rare company. Kilgo, a native of Darlington, S.C., writes about his rekindled interest in the natural world and hunting after years of teaching English at The University of Georgia. Though bird watching, fishing and several types of hunting are part of Kilgo's reintroduction, a prominent theme is his quest for an antlered buck in the wild swamps of South Carolina.

So what sets this book apart? Perhaps it is the wide gap it fills between the pedestrian, but useful, how-to books and the handful of literary works that depend on hunting largely for analogy. Kilgo certainly uses hunting as a vehicle, especially one that reintroduces him in a vaguely Faulknerian way to his almost forgotten family history and old homeplaces in the Carolina lowlands near where he was raised. But Kilgo is interested in hunting on its elementary level, not simply as analogy, and if that lessens its literary flavor for some readers, it is nonetheless refreshing.

Pure literary hunting can be tough going, and often does not ring true. Faulkner's hunts are mystical, full of ritual—hunting through the eyes of a poet. Hemingway's hunting is often symbolic, and both he and Ruark cling solemnly to perceived tests of manhood and tradition that often seem contrived. Kilgo, on the other hand, more often simply sees hunting as it is, and he describes it in a spare, yet elegant style.

"When I knelt beside the animal, the thawing mud soaked through the knees of my one-piece outfit. I ran my fingers lightly over the belly. It was hard and distended. Hundreds of little ticks were crawling through the hair around the genitals. My knife felt as useless in my hand as a tennis racket. Billy ought to be here, I thought. He would show me what to do. Better than that, he would show me by doing it himself. *So*, I realized, *it's not just the not knowing how that's bothering you. If you can shoot an animal so easy, looks like you ought to be able to cut it open.*"

How many deer hunters facing their first kill have shared those ironic thoughts, but who besides Kilgo has written of them? It is Kilgo's skill that he sustains this sense of realism throughout, yet does so without sacrificing style. A hunter will read this book and frequently say, Yes, that's exactly how it is.

Kilgo not only accurately depicts hunting, but also captures the often humorous life in a typical hunting camp, especially the way hunters really speak and act around one another. At one point Kilgo shoots a feral hog, and two members of his hunt club help him drag it out.

"When we finally got the pig out to the road, Jack put his heavy old arm around my shoulder and said, 'Jim, it's a hell of a lot harder to drag somebody else's 'paig' than it is your own.' "

Throughout, Kilgo reveals a sensitive—even intimate—awareness of the natural world and the hunters who seek it. Nor does his love of the wild country and animals he hunts or simply watches seem contradictory. A hunter will feel at home here, and a nonhunter might truly understand hunting for the first time.

Kilgo seeks both a renewal of the hunter's instinct and an opportunity to seek the deepest wilderness he can find—wilderness so deep that it might possibly still hide a woodpecker thought extinct for decades. This quest for wilderness also becomes a window into Kilgo's roots and, equally important, a way of initiating his son into this ancient sport.

If there is a criticism, any minor quibble to be made, it's that two chapters towards the end of the book involve fishing. Though they echo one theme—the quest for wilderness and solitude—they do little to advance the plot and tend to blunt the impact of the powerful hunting chapters that dominate.

Still, it you're a hunter, you'll find much to admire from this kindred spirit. Kilgo has been there, and he's just the kind of company you'd seek to share your hunt. He's invited you to share his. By all means, go.

Deep Enough For Ivorybills, *by James Kilgo, $14.95, Algonquin Books Of Chapel Hill, PO Box 2225, Chapel Hill, N.C. 27515-2225.*

October, 1988
Volume 52, Number 10

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WILDLIFE IN NORTH CAROLINA

Wildlife in North Carolina is the official educational publication of the North Carolina Wildlife Resources Commission, and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources and the environment we share with them.

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Back Of The Book *by Mark Taylor*

Cover *A rising sun silhouettes this fall bass fisherman, and evidence of a successful day is already in hand. Photograph by Eugene Hester.*

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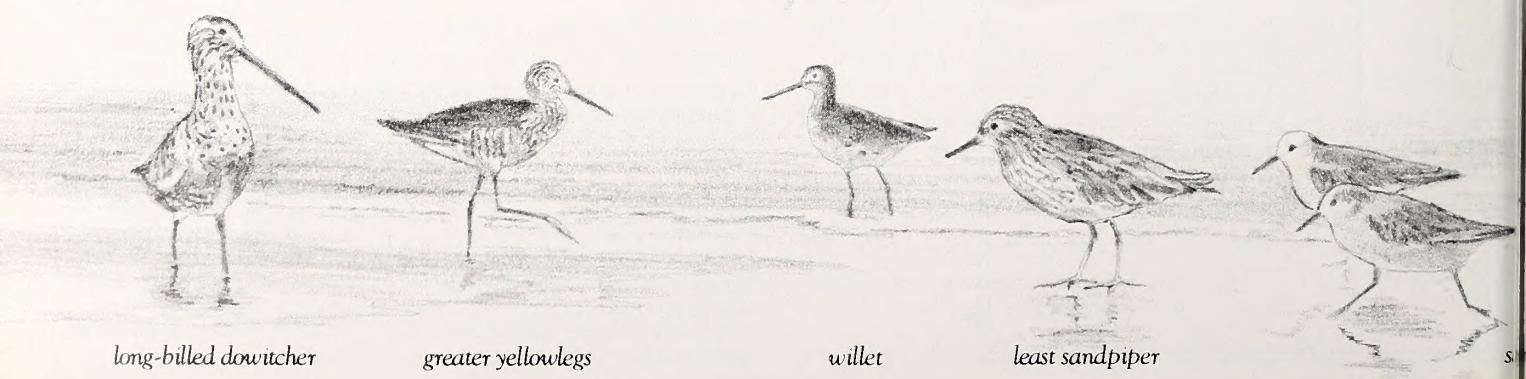
Woodcocks are migratory *birds that winter in North Carolina. Secretive birds, they prefer wet forests or even pine uplands as habitat where they can use their long bills to probe for earthworms. Earthworms form about 90 percent of their diet.*

Woodcocks and snipes *are shorebirds, kin to sandpipers and other members of the Scolopacidae family. A look at some other cousins shows that the members of this family are characterized by long, probing bills. In time, the woodcocks and snipes moved inland while curlews, godwits, sandpipers and the like remained true to their marine heritage.*



long-billed dowitcher *greater yellowlegs* *willet* *least sandpiper* *si*

Bottomland Twin Bill

written by Lawrence S. Earley / illustrated by David Williams

***The Wilson's snipe** is another game bird that winters here. It is slightly smaller than the woodcock and prefers slightly wetter habitats. It probes in wet mud to find grubs and other larval insect forms, although it likes earthworms too.*

gs

Coming to your neighborhood bottomlands real soon—two shy migrants from up north and hankering for worms.

That's the way the movie moguls might describe the return to North Carolina each autumn of the Wilson's snipe and the woodcock. Migrating south from their summer nesting grounds in New England and Canada, these two reclusive game birds will be frequenting the boggy areas along forested streams and drainage ditches. And though they possess many of the habits of upland game birds, snipes and woodcocks actually have more in common with shorebirds.

That's because they are shorebirds. Their startlingly long bills are a clue. You won't find anything like them among upland game birds, but sandpipers have similar bills and so do dowitchers, curlews, godwits and the like. In fact, all of these birds—snipes, woodcocks, sandpipers, dowitchers etc.—belong to the largest shorebird family, the Scolopacidae: the sandpipers and snipes.

Over time, suggests one researcher, this family evolved along two different paths best summed up as "the snatchers" and "the probers." Among the former are the sandpipers and the like which take their food mostly from the surface. The other line led to birds that probed for their food in shallow water, and among this group were specialists like the snipes and woodcocks that developed a flexible bill to get at foods in shallow water. Then, for some reason lost in the mists of time, these two birds abandoned their marine habitat for inland quarters.

Here their specialized bill enabled them to exploit the food in the moist, organic soil along streams and other wet places. Earthworms form about 90 percent of the woodcock's diet, and when the bird hits a mother lode it can consume an incredible number. Audubon noted that the woodcock "swallows as many (earthworms) in the course of a night as would equal its own weight." Snipes also eat earthworms, but insects seem to be their main food, especially larval forms which range from 10 percent to 80 percent of their diets.

Both birds feed by inserting their bills into the soft soil for seconds at a time—snipes have been observed probing for as much as 30 seconds. The tip of both bills is flexible—it opens and closes. In woodcocks, at least, numerous nerve endings enable the bill not only to feel the vibrations made by moving worms but also to detect whether worms are present at all. Research at N.C. State suggests that woodcocks' bills have chemical receptors that taste the mucus left by worms. The bird will conduct its examinations by probing the ground for several seconds at a time, and when prey is located the tip opens to seize and swallow the critter underground.

Though snipes and woodcocks look somewhat the same, the snipe is generally smaller and more darkly colored. The woodcock is about the size of a bobwhite and has a distinctive tawny breast. The woodcock's prominent eyes are also placed farther back on the head than the snipe's and its wings are shorter and less pointed. In addition, the snipe is less nocturnal that the woodcock and it tends to feed in wetter habitats.

These birds may have once stalked the open seashore, but today they've learned to conceal themselves well and it's always a rare delight to startle them into their twittering, near-vertical flight.

OCTOBER BASS

If you put away your fishing rod too early, you may be missing the best bass fishing of the year.

written and photographed by Gene Hester

Imagine a day like this. A gentle, cool breeze is blowing from the northwest and the eastern sky is turning pink at dawn. Signs of the changing season are all around. The trees are red and yellow, and a pair of recently arrived pintail ducks wing past in the morning mist. You take a deep breath of the fresh clean air and feel thankful for the chance to be outdoors — bass fishing.

That's right, you may not associate bass fishing with autumn, but the fact is that it's one of the best times of year for it. Bass that have been sluggish during the hot summer months are on the prowl and plenty hungry. The water is cool, clear and well oxygenated, and fishing pressure is low because so many anglers have moved on to other interests—hunting, football or golf. Indeed, a couple of fishermen might well have an entire lake to themselves, as we did.

By the time the sun came over the horizon that morning, my nephew William and I had motored across the end of the lake and reached the edge of a submerged weed bed. William started fishing with a plastic worm and I tied on a weedless silver spoon with a plastic skirt.

William had rigged the worm without weight and with the point of the hook embedded in the worm to make it weedless. That way it ran shallow and slid across the weeds. On the third cast William's line suddenly tightened.

"Watch this one," he said. "He's trying to take this worm away from me!"

I looked around just as he leaned back to set the hook. "He's a good one," he said, as I grabbed the landing net. A minute or two later we admired the first bass of the day,

***Autumn ushers in** cooler weather and cooler water temperatures. Largemouth bass like the one this angler is landing (left) frequently go on feeding sprees, and good fishing often lasts from October well into December.*

GRACE

then released him.

After catching a number of other bass, we noticed that almost all were striking the lures near the surface. Maybe the bass would even come to the top for them, we thought, but was the water too cool? There was only one way to find out.

William tied on a floating Devil's Horse, a slender wooden lure with a propeller at each end. "This one will get 'em," he said. I agreed it looked good.

He cast the lure across the submerged weed bed, and began to retrieve while twitching his rod tip so that the propellers made an erratic gurgling sound as the lure moved across the surface.

"Watch it," said William. "There's one coming for it."

The bass was swimming over the weed bed close enough to the surface to create a noticeable wake, but as it approached the lure, it stopped, and the water seemed to rise about an inch around the lure. That's the kind of suspense that causes your heart to skip a couple of extra beats. Suddenly, the bass grabbed the lure. He made a hard run, but William slowed him down and brought him to the boat.

By midday, high, thin clouds had moved in, and that probably helped our fishing because the light level remained low all day, and the bass continued to feed on the surface — something they'd normally do only in early morning and late afternoon. In mid-afternoon when the fishing was at its peak, William held up a 3-pound bass and said with a grin and an exaggerated imitation of a TV commercial, "Ya know, it don't get no better than this!"

By the end of the day we had landed and released over 40 bass, all between 1 and 4 pounds, many of them caught on topwater lures.

That's the kind of fishing you can expect on good fall days — not every day, of course, but often enough. Nor is good fishing the only incentive. On our fall trips, we're often treated to a constant parade of passing wildlife, especially waterfowl in full migration.

Over the years we have taken a lot of fall fishing trips to such places as Currituck Sound and large natural lakes like Phelps and Mattamuskeet. Rivers like the Roanoke, Tar, and Chowan all produce some good fall bass fishing, and tributaries of these rivers are good, too. Sometimes, in addition to bass, we catch other species. Chain pickerel and bowfins readily take bass lures, and occasionally we get a crappie or catfish.

Many of North Carolina's large reservoirs also produce good bass fishing, but the technique for catching them may be different. Bass in these lakes tend to concentrate around physical structures such as gravel bars and drop-offs, and they also often follow schools of shad or shiners. Finding these baitfish can be an important step in finding the bass.

Though bass will feed on the surface on mild fall days, we often find that fishing 2 or 3 feet deep is more productive. When fishing in weed beds or heavy brush I like to use a silver spoon with a pork frog or plastic skirt. A purple plastic worm rigged weedless is good, too. Other lures which consistently produce fall bass include floating-diving minnow imitations like the Rebel and Rapala, as well as spinnerbaits and Mepps Minnows.

For topwater lures it's hard to beat a Devil's Horse or Hula Popper. Also, floating-diving lures like the Rebel can be fished as surface lures very effectively. When twitched erratically or retrieved very slowly they stay on or near the surface and create a wobbling, diving, fluttering motion that can be deadly for bass.

When you can find them, submerged weed beds in water 2 to 3 feet deep can be dynamite. If the bottom is firm enough, you can fish such weedbeds by wading with hip boots or waders. Often this works better than fishing from a boat.

A lot of bass fishermen pass up shallow water weed beds to fish deeper water. In one way they may have the right idea, because this is the time of year when the bass are ready to move to the deeper water for winter. But in my experience, most bass are still in relatively shallow water in October because temperatures are comfortable for them there.

Bass are likely to remain active until cold weather sets in, sometimes throughout November and well into December so don't put your fishing gear away too early.

The time to start, however, is when tree leaves begin changing color and the hint of a cool autumn breeze is in the air. That's all the invitation you need. Grab that fishing rod, a few bass lures and head for the lake. It's bass season. ⊠

***Topwater lures like** this twin-propped plug (left) frequently provide memorable bass fishing on cool fall days, and some of the hottest action may occur after the first frost. Since many sportsmen switch to hunting this time of year, there is less fishing pressure on lakes, ponds and rivers.*

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Return Of A Native

The vast forests of longleaf pine that once covered the Coastal Plain are gone forever, but landowners are rediscovering the virtues of our state tree.

written and photographed by Lawrence S. Earley

It's midmorning at Bladen Lakes State Forest and the two of us are looking at a small plantation of 40-foot-tall longleaf pines. It's a pleasant scene with the sunlight casting slanted shadows beneath each tree, but one of us is having a hard time admiring the regular ranks of even-aged pines. At another time he might have shaken his head and called it a wildlife desert.

Yet this 30-acre seed orchard is a major reason why this beleaguered pine is making a comeback in North Carolina, and for even the most ferret-eyed, pine-hating wildlifer that ought to be good news indeed. After flirting with extinction early in the century, the longleaf seems to be undergoing something of a revival in the century's dog days. And if this native conifer is rewoven into the North Carolina landscape, it will represent a victory that all of us can take pride in.

A good percentage of North Carolina's future longleaf forests will spring from the seed produced in this orchard. That's what Claude Hood is telling me as we walk the sunny aisles. Hood has been the forest supervisor here since 1967, the year after the

Forest Supervisor *Claude Hood checks longleaf pine sapling in a new seed orchard at Bladen Lakes Forest. The N.C. Forest Service is encouraging landowners to grow longleaf pines especially in the deep, sandy soils of the Coastal Plain.*

A new generation *of faster-growing longleaf pine trees is springing from seed produced in this 20-year-old stand, the first longleaf seed orchard in the world. The orchard grows at the Bladen Lakes State Forest near Elizabethtown.*

Return Of A Native

orchard was planted. At the time, it was the first longleaf seed orchard in the world and it was established at least partly to make up for a previous forestry strategy that backfired badly. It's something that still embarrasses foresters like Hood.

"In the 1950s and 1960s," he says, "we were encouraging landowners to plant what was then considered the 'miracle tree,' slash pine. It was fast growing and straight and tall and so there was a big push to plant it." It was understandable. In the wild, longleaf dawdles in its early years, preferring to put its nutrients into a deep tap root rather than upward mobility. Little wonder then that growers preferred the explosive slash and loblolly pines to the pokier longleaf. By the sixties, thousands of acres had been planted in slash pine, but it wasn't long after that most were being bulldozed over.

"On these dry, sandy soils slash pine pooped out after about 15 years," says Hood. "It was just a major mistake. We didn't listen to Mother Nature."

What Mother Nature told anyone who wanted to listen was that the deep, sandy soils were good for growing only one tree species, and it wasn't slash pine. It wasn't even loblolly pine. "Among all the pines," Hood says, "longleaf pine is uniquely suited to the inhospitable environment of the sandy soils that cover much of eastern North Carolina. It's resistant to fire, and it resists insects and diseases far better than loblolly or slash. It's a superior tree, despite the fact that it's slow growing."

Originally longleaf pine was the dominant tree species throughout eastern North Carolina (See *Wildlife in North Carolina*, "Looking for Longleaf," August 1988). It grew in many different soil types, from wet to dry, and flourished in the well-drained, nutrient-poor sandy soils that discouraged other vegetation. Longleaf developed a superior resistance to fire that enhanced its dominant position in the landscape.

And though a natural monoculture, longleaf has ties to the life cycles of many wildlife species. The endangered red-cockaded woodpecker, for example, requires old-growth longleaf trees, trees over 70 years old, for their nesting. The original longleaf ecosystem contained foods for many birds and mammals, including deer, fox squirrels, quail, and doves.

It's also a tree loaded with historical and cultural meaning to North Carolinians, for it was the most valuable commercial tree in the state for nearly 200 years. Not only did it produce strong sawtimber, but the tree's bounteous resins were the foundation of the naval stores industry, North Carolina's earliest industry. For nearly 50 years in the 19th century, North Carolina's virgin longleaf forests were the major source of naval stores for many countries of the world. But ravaged by turpentiners and cut over by loggers, the virgin longleaf forest was destroyed by the early 20th century. Worse, there was little regeneration and many observers feared that longleaf would become extinct.

Today some remnant second-growth forests are managed in state and national forests such as Bladen Lakes State Forest and the Croatan National Forest. The N.C. Nature Conservancy also owns extensive longleaf pine savannahs on its Green Swamp property in Brunswick County. And two of the largest stands of longleaf pine are managed by the N.C. Wildlife Resources Commission on the Sandhills and Holly Shelter game lands.

But until recently not much new longleaf was being planted, so completely had loblolly vanquished its rival. Then gardeners and developers "discovered" pine straw. The bronze-colored needles dropped by pines are a valuable and handsome-looking garden mulch, and satisying the demand for the straw has become a $15 million-a-year industry in North Carolina. With the depressed prices for wood products timber growers often make more money from their pine straw than from the wood. Since longleaf grows longer needles and drops them more often than other pines, many growers are now clamoring for longleaf.

Taking advantage of this demand, the N.C. Forest Service is mounting a major educational program to convince landowners of the benefits of longleaf on many different soil

Longleaf pine seeds *extracted from cones are chilled and stored at the state's Claridge Nursery in Goldsboro. The N.C. Forest Service maintains a 3-5 year supply of seed.*

Ten-month-old longleaf *seedling shows the beginnings of the deep tap root that the pine grows in its early years.*

Wilson Norris inspects *beds of grass-like seedlings at the Claridge Nursery. These beds will be lifted in December and the seedlings packaged for delivery to planting crews. The nursery maintains 18 acres of longleaf beds which foresters hope will produce 3½ million seedlings this year.*

sites. And the seed orchard at Bladen lakes is the key to that program.

The trees in the orchard are grown from grafts or clones from 20 parent trees chosen for their superior qualities. A metal tag on each tree indicates the female parent. In a demonstration area elsewhere in the forest the progeny from the clones are tested against each other. Although longleaf has been faulted for growing slowly in its early years, Hood points out that 76 percent of the seedling progeny from these trees came out of the grass stage in one growing season. Five to seven years is normal.

When cones appear on the trees, mechanical tree shakers knock them to the ground and they are trucked to the Claridge State Forest Nursery in Goldsboro. There they are dried and the seeds are extracted and stored. Eventually many of these seeds will be planted in the 18 acres of seed beds that the nursery has allocated for longleaf. Nursery supervisor Wilson Norris says that 5 million longleaf seeds will be planted in beds this fall and coming spring.

"Longleaf is unusual in that we seed it primarily in mid- to late September," says Norris. "But since a rough winter can destroy a large part of a seeding we plant half in March, just in case." The seeds planted this fall will be lifted after Thanksgiving in 1989.

"There's a lot of mortality in these seed beds," Norris says, "so though we're planting 5 million seeds our goal is to harvest 3½ million. But that shows you what an increase in demand we've had. Three years ago we were looking for 1½ million seedlings."

Once the seedlings are lifted from the bed they are packed and are available to landowners for planting. (See "Planting Longleaf.") Norris says that though some of his customers have ordered 50,000 to 70,000 seedlings, many others are people with only a few acres who plant longleaf because they love it. "Even if it's not what you'd call a longleaf site, they purchase longleaf seedlings to plant because it's a beautiful tree and that's what they want on their land."

One of these with a special fondness for longleaf is Jesse Perry, an educational specialist at the N.C. Museum of Natural Science in Raleigh. Twelve years ago, he says, he bought longleaf seedlings from the Forest Service and planted several hundred on an acre or two of his family's farm in Perquimans County. Longleaf grew there originally

Return Of A Native

and he wanted to see it restored to the area. "It's not really a timber stand," he says. "I did it because I love them. They're so majestic when they're fully grown. I nursed them through their grass stage and fertilized them. Today they've grown 18 to 20 feet."

But Perry was just beginning. He collected seed from 15 or 20 longleaf pines in Perquimans and Chowan County and in his Raleigh backyard, he's put in a little nursery of his own to raise scores of seedlings.

"What I'm interested in is the collective genes in a population, especially those at the extremes of their range," Perry says. "All trees are different and it may be that the longleaf pines at their northern limits may have genes that are different from those at their southern limits in Florida. Maybe some of those trees have genes that make them more resistant to cold or ice.

"But at the extremes of their range, longleaf is rarely planted back once it's harvested. Loblolly goes in instead. So I guess I'm doing a little seed banking, storing the genetic material of longleaf against the possible day that we'll need to draw it out. I just hate to think of native stands going extinct."

Perry is donating some seed to N.C. State University in Raleigh and his little trees will be available to researchers. Unlike the Forest Service, whose seed orchards are derived from 20 of the very best physical specimens of longleaf, Perry's gene banking is purposely unselective. He took seeds from the plainest and least attractive trees as well as the prettiest. "You never know," he says. "There may be a valuable gene in those little, scraggly trees."

Few landowners have the specialized interest in longleaf of a Jesse Perry, but foresters point out that there are other reasons for planting the tree besides its yield of pine straw. For one thing, longleaf yields strong and sturdy wood. And longleaf is uniquely suited for an inexpensive form of harvesting and natural regeneration ideal for small and large timber growers.

"A lot of landowners have been clear-cutting their land in recent years and not planting a new forest because it's a cost they can't afford," says Claude Hood. "But shelterwood cuts are perfect for longleaf and on our demonstration area at Bladen Lakes we've shown that by doing a shelterwood cut a landowner can harvest wood and establish a new stand cheaply."

In a shelterwood cut, says Hood, the best seed trees on the tract are marked just before a big mast year — longleaf produces abundant seeds once every five to seven years. The other trees in the stand are harvested and the stand is control burned to prepare the seed bed. When the cones dry out and the seeds drop, the seed trees regenerate the stand naturally.

The results are dramatically cheaper than clear-cutting, Hood says. "In this day and time when landowners don't want to spend money to get their land back into production, it's an ideal method. We spent $23 an acre, primarily for the burn, doing a shelterwood cut on our demonstration area. If we clearcut it and planted new trees it would have cost $150 to $200 an acre."

To this story of hope must be appended a somewhat melancholy reflection. The beautiful and useful longleaf pine is due a resurgence after all it's endured, but make no mistake, there's a difference between a tree and an ecosystem. The longleaf pine forest that once dominated the landscape of the Coastal Plain will never be restored in all its glory because the delicate ecology of the forest, with its complex requirements of virgin soils and frequent fire, no longer exists.

But if it's too late to conserve the once-vast forest ecosystem, it's still possible to support the restoration of the tree itself to at least part of its former range. This may be a worthy goal for a people who have chosen the longleaf pine as state tree and whose poem toasts the "land of the longleaf pine." Let's give a whistle and a cheer for the return of this native—it's been gone a long time.

***A twig and bud** selected from a superior longleaf tree is grafted to a root stock to form "improved longleaf pine trees." Seed from these four-year-old seedlings will help restore longleaf pine to some of its former range.*

***Jesse Perry shows** off some of the longleaf seedlings he planted in his backyard nursery. Because longleaf pine has disappeared over much of its former range, Perry hopes his private efforts will keep alive different genetic strains of the tree.*

Growing Longleaf

Can I grow longleaf on my land?

The best sites for longleaf pine are well-drained upland soils tending to coarse grains with no existing hardpan. But longleaf will do well on many different sites and a professional forester can tell you whether or not your land is suited for longleaf.

Where can I get longleaf seedlings?

Improved longleaf seedlings can be ordered through your district forester, or you can order directly from the state's Claridge Nursery, Route 8, Box 380, Goldsboro, N.C. 27530. (919) 735-9116.

Can I reduce my longleaf planting costs?

The costs of establishing longleaf pine may be reduced under state and federal cost-share programs. For more information about these incentives contact your district forester (see below). District biologists with the N.C. Wildlife Resources Commission can also explain the benefits of these programs.

How long do I have to wait for longleaf products?

Pine straw: 15-20 years (depending on the fertility of the soil).

Pulpwood: 20 years.

Poles: 30-40 years.

Structural timbers: 60-70 years (depending on the site).

Red-cockaded woodpeckers: 70-100 years.

For more information on cultivating longleaf pines, write: N.C. Forest Service, 512 N. Salisbury St., Raleigh NC 27611, or contact your district forester through the central forest office at (919) 733-2162.

LOOKING FOR "MISTER" WRIGHT

Archaeologists knew the remains of one of the last paddlewheel steamboats to ply the Cape Fear were in a Wilmington marsh, but few guessed its engine would ever run again.

by David Carnell

On a cold January morning in 1988, I looked on as a romantic bit of Cape Fear history leapt to life once more. The 100-year-old mechanics of the stern-wheel river steamer *Gen. H.G. Wright* had turned for the last time in 1924, but now they were poised and greased and ready for a proper resurrection.

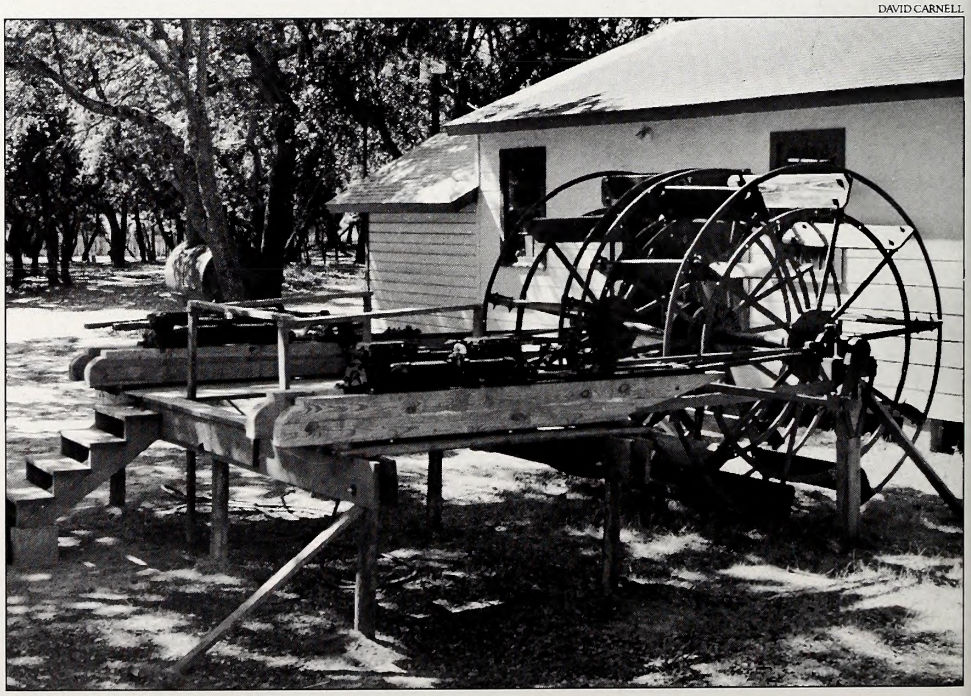
On a platform 5-feet off the ground the two steam engines were linked to a 10-foot-wide red paddlewheel mounted between two posts. I watched Gerry Dunn slowly open a valve. The piston shaft of one engine slid back, the other forward. The connecting rods moved up and down as they pushed on the eccentrics of the big wheel. The wheel began to turn accompanied by the whoosh of the compressed air driving the engines, the soft clunking of the linkages, and the breeze stirred by the big wheel. The *Wright* was alive again.

Wright was a U.S. Army Corps of Engineers steamer, a snag boat that worked on the Cape Fear, Northeast Cape Fear, and Black rivers removing trees, stumps, logs, and snags and dredging to keep the rivers open. Built in Fayetteville in 1882 as a side-wheel steamer, she was converted to a stern-wheeler in 1896 in Wilmington. The original iron machinery — boiler, engines, and paddlewheel — outlasted several wooden hulls through her active service. Abandoned on Eagles Island in 1924, the *Wright* rusted, rotted, and sank in the mud.

The *Wright* was one of several derelict hulks on Eagles Island, but when staff from the N.C. Underwater Archaeology Unit of the Department of Cultural Resources surveyed the Eagles Island wrecks in 1986 they picked the steamer as the most interesting candidate for survey, recovery, and restoration. The boat was the oldest on the site, had been built in the area, had worked on the river all of its career, and was typical of the steamers that rode the rivers of North Carolina's Coastal Plain. The New Hanover County Museum agreed to restore and exhibit the machinery of the *Wright* if the archaeologists would recover and preserve it; work was set to begin in the spring of 1987.

NEW HANOVER COUNTY MUSEUM

***The 19th-century** sternwheeler H. G. Wright lies derelict in a marsh off Eagle's Island in Wilmington (above) before the mechanical parts were recovered and restored (below). The 100-year-old machinery will be featured at the New Hanover County Museum in Wilmington.*



DAVID CARNELL

Enter Gerry Dunn. His great-grandfather Luntsford "Lunch" Johnson and his grandfather, Willis Johnson, lived near Strawhorn Landing on the Black River. They ran pole boats — scows poled up and down the rivers with calculated help from the tidal currents — and then early steamers such as the screw tug *Bee* and the steam flat *Black River*. Gerry was born near Strawhorn Landing in 1937, but grew up in Wilmington. Chance landed him a job in the maintenance department of a local dairy and he began to develop a wide range of mechanical skills. He set up his own electric motor repair business, which flourished and prospered so well that Gerry sold out to his two sons in 1985 and retired. Gerry had first seen *Wright's* machinery while he was photographing on Eagles Island in the 1970s. His interest in technology and industrial history reminded him of those relics and he volunteered for the recovery project that was ready to start.

The first work party attacked Eagles Island in April 1987. Cutting reeds and moving debris exposed the engines, the upper half of the sternwheel, the top of the boiler, and the outline of the hull. Digging and sluicing mud away with a powerful stream of water uncovered the lower part of the wheel, portions of the wood blades of the wheel, and much of the rest of the machinery. The boiler was uncovered and

NEW HANOVER COUNTY MUSEUM

In its heyday, *the* Wright *was a U.S. Army Corps of Engineers snag boat. She dredged the Cape Fear and Black rivers and removed dangerous snags. Here she helps construct the Lock and Dam No. 2 on the Cape Fear River near Elizabethtown in 1916.*

emptied of mud. Now, Gerry directed disconnecting the machinery into manageable pieces. The connecting rods and valve linkages were separated from the engine and the wheel, the engine mounting bolts were removed or cut, and the timbers supporting the wheel were cut free.

When everything was ready to be lifted clear, Donald Bordeaux of Bordeaux Salvage and Construction Co. donated the services of his tug and floating crane. On July 22, 1987, he supervised the rigging and in four loads the boiler, each engine, and the sternwheel were lifted off and set on the crane's barge. All the days of preparation paid off as each load was picked up without a hitch.

At the laboratory at Fort Fisher, the machinery was completely dismantled. The parts were stabilized against further deterioration either by electrolysis or by heating them in an oven. Now the restoration work could begin.

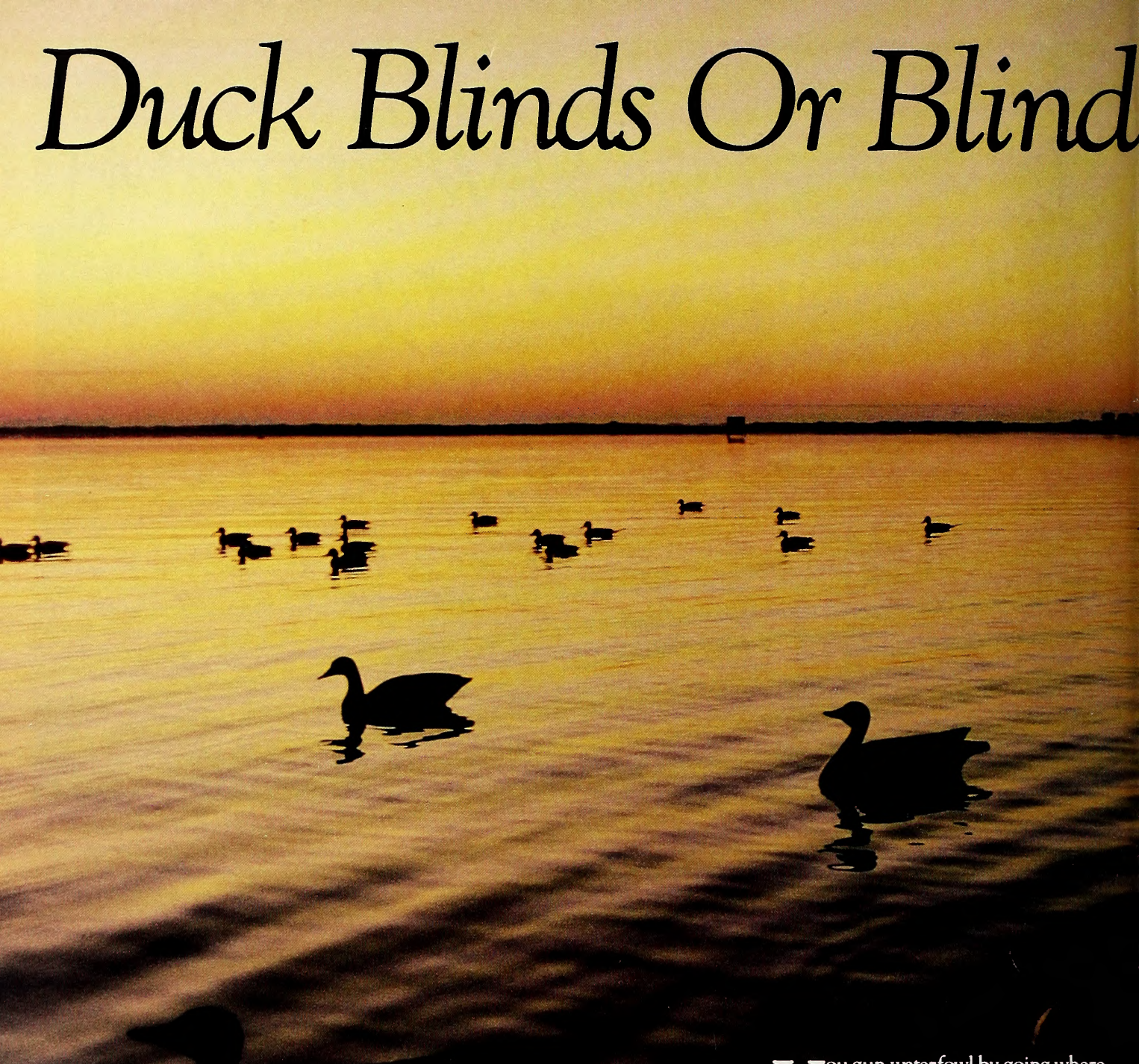
At first experts believed that the best that could be done with the recovered machinery would be to stabilize it and set it up as a static exhibit, but Gerry Dunn decided to take the restoration as far as he could. Only a little better than half of the big sternwheel was left. Gerry had bars bent to complete the circles of the wheel and welded them in place. New bucket clamps were made patterned on the recovered ones and all the wood buckets were replaced. Supported on two heavy posts sunk in the ground, the wheel now turned easily by hand.

In his shop, Gerry started serious work on the engines. He built up corroded areas of the cylinders with metal-filled epoxy resin and then ground the surfaces smooth. He made new steel piston shafts and new parts to replace missing ones. With two engines, at least one of every part was intact to serve as patterns for the missing ones. In 1890, the Corps of Engineers reported that "A new cylinder and shaft were built into the steam launch *H.G. Wright*," and sure enough, Gerry found that the two engines were different. When his lathe or other tools were not large enough, Gerry devised jigs and methods to get the job done. In December 1987, the rest of the group watched Gerry turn on compressed air to one engine. The piston moved all the way back, a helper reversed the valve rod and the piston moved forward. The engine was operable. A few weeks later the whole assembly was running at Fort Fisher.

The exhibit of the *Wright's* machinery at the New Hanover County Museum in Wilmington will be what Gerry Dunn dreamed it could be — an operating system. The engines and sternwheel will be installed first in the boat shed. Compressed air will operate the engines and the wheel. But soon it will have an even better home. The museum is being expanded to nearly five times the exhibit space it has now. The architect and exhibit designer have begun their work and one of their challenges is to make the reborn machinery an especially exciting part of the new Museum of the Lower Cape Fear.

The steamboat era may be over on North Carolina's rivers, but some people say a new era may be beginning in Wilmington, thanks to a few friends. ⊠

Duck Blinds Or Blind



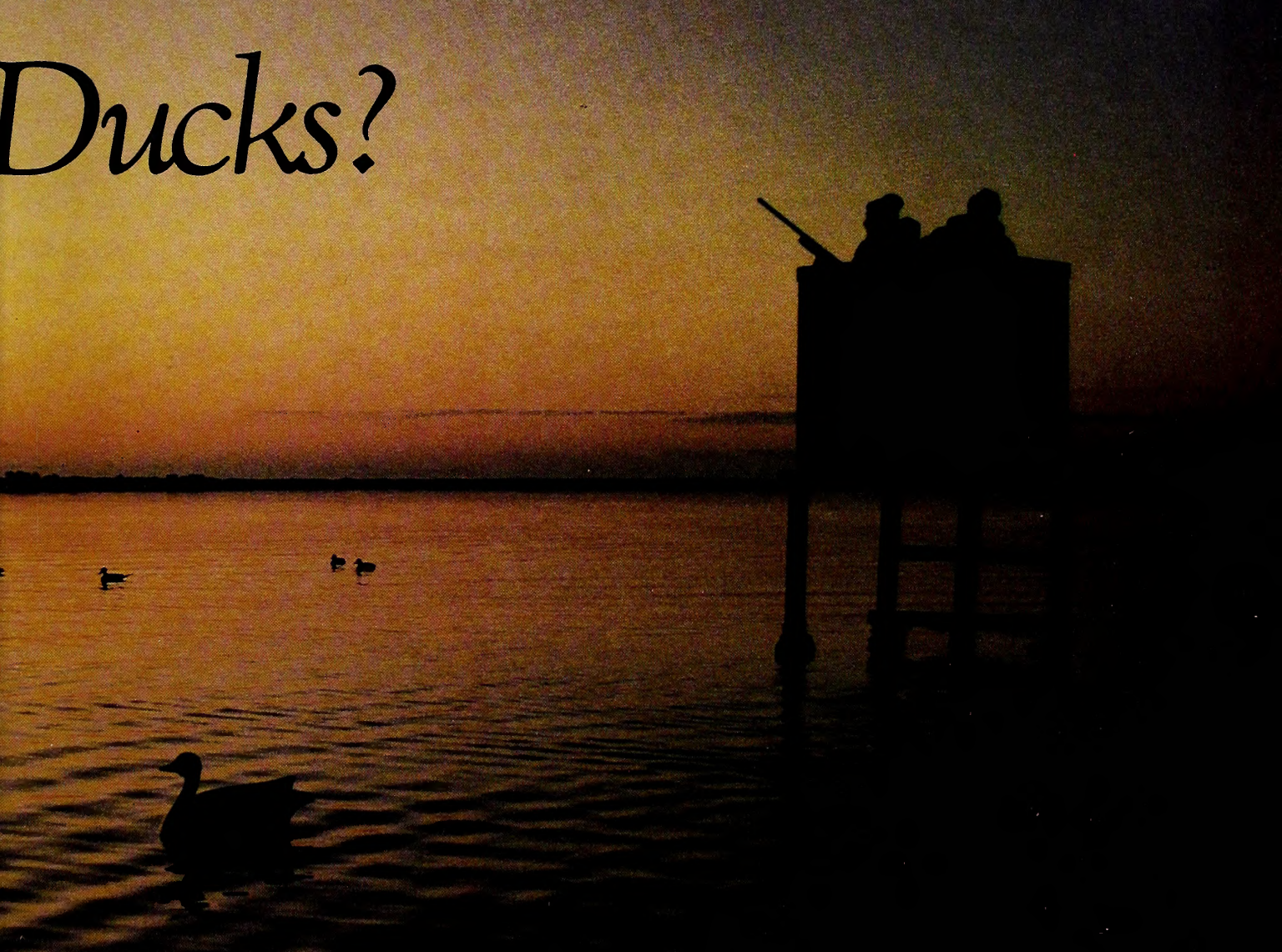
Since ducks and geese have excellent eyesight, the successful hunter has but one choice — learn to hide.

written and photographed by Joel Arrington

You gun waterfowl by going where they will be and hiding until they fly within range. In a nutshell, that's all there is to duck and goose hunting. Depending on location and the species we pursue, we may take few pains in concealing ourselves or another time go to remarkable lengths to make blinds effective and comfortable. In a state with a diversity of waterfowl and conditions for hunting them, virtually every type of blind is used in North Carolina, including one that is found nowhere else.

There are circumstances in which no blind at all is in order. You might stand

Ducks?



knee-deep in a wood duck pond surrounded by vegetation. Camouflage clothing helps. If you remain still until ducks are in range, usually they will not see you until too late. But you must not let your silhouette project against the sky. This method works best at low light levels, which is when wood ducks fly anyway.

A small step upward in the hierarchy is the improvised blind of natural material. You just hunker down in cover, maybe break or chop a few myrtle branches or some marsh grass to pull up around you. You can kill birds this way, but you probably will not be comfortable for long. There is nothing to break the wind and nothing to sit on unless you can find a handy stump. For a lot of people, kneeling and sitting on our heels is painful after a few seconds. Others can cross their legs and sit on the ground without pain for hours. For anyone, a stool is a helpful accessory.

Already a typical duck hunter is freighted with paraphernalia. He lugs gun, shells, decoys, steel thermos, lunch, a stool, slogging in waders through knee-deep mud or worse. Weight is always a factor, but usually he can squeeze in a pack or bag with a piece of camouflage netting. This, in combination with natural cover, affords an opportunity to build a more concealing blind.

John Ochs of Frisco on the Outer Banks built himself a portable blind of chicken wire. It stands about 4 feet high and is tacked to light pine uprights. He weaves new marsh grass through it each fall, rolls it up and throws it into his johnboat. He can set it up and throw out a few decoys in minutes.

The box is no doubt the most commonplace type of blind in waterfowl hunting and the most varied. It can be a simple floorless structure of four walls with a door through one end. It might have a floor and be on pilings, either on shore

or in the middle of a sound. From about Oregon Inlet northward, boxes are bushed. Hunters go to great trouble to cut, transport and attach to the box such vegetation as pine trees, marsh grass or myrtle. On open water from Oregon Inlet southward, however, the bushed box is unusual. Most stand naked on a reef. No studies have been conducted, but I suspect results from each type are comparable.

One can only speculate why hunters in one corner of the state insist on bushing a blind while others elsewhere will not waste their time. In the relatively more open water of Pamlico Sound, perhaps ducks get used to seeing the naked boxes, like navigation markers and range markers, stakes and other stick-ups bristling from the water everywhere they go. Birds have it in their genes to be afraid of something pouncing on them from cover. They are less wary in open water.

You enter Pamlico Sound and Core Sound boxes usually via a ladder. You are then perched 4 to 8 feet above the water, often shooting down on decoying fowl. When the blinds are on reefs, as usually they are, you just climb down and wade for your birds, hurrying to reach them before they are blown into deep water. This is no place for a dog unless a blind has been modified with a platform at water level.

Box blinds can be elaborate. Most in Currituck Sound will seat four and have room for a skiff to be pulled under them in the back. Several hundred yards away, the guide hides the boat he uses to cross the sound with his party, and he uses the skiff, which is stored in the blind during waterfowl season, to set the decoys and pick up birds. By far the most outrageously sumptuous blinds I have ever heard of are on Tennessee's Reelfoot Lake. Reportedly several are actually cabins, complete with kitchens and bedrooms, from which hunters shoot ducks off the roof or front porch, as it were.

Box blinds don't have to be that grandiose to be comfortable. They block the wind, you can have a heater of some kind, and there is room to stretch out. The disadvantages are they are expensive and some trouble to build. At the very least, they will have to be repaired and bushed every season — if they are bushed at all. If there has been any ice, they may have to be rebuilt from scratch. Hard freezes followed by thawing and wind have been known to chop off hundreds of blinds at the water level overnight.

No box blind specifications are right for everyone. A tall man needs more room and wants the seat and walls higher. If you are building it for yourself, of course, you can make it any way you want it. Avoid a box you cannot see out of, but build it so you are obscured from fowl as much as possible. Just the right balance is difficult to strike the first time. Cut observation slits at eye level, so you will not have to strain to reach them. Ideally you will be spending long hours in the blind for several days each season, so it is worthwhile to make it comfortable. You almost surely will want a high back to mask your silhouette, perhaps a half roof. If you use a retriever, you will have to build a place for the dog to sit where it can see what is going on and be out of the weather, yet still be able to jump in the water.

Boxes can be partially recessed in the ground. If you go all the way with it, you have the pit blind. Usually they are dug in more or less dry wheat or soybean fields for geese. The box keeps the sides from caving in, you have good visibility and are totally out of the weather.

There is hardly any task so laborious as putting in a pit blind, especially in a marsh where water fills the hole. Here you let the top of the box stick out a foot or two to

***The most popular** type of waterfowl blind on Core Sound and other nearby large bodies of water is the stake blind (previous page). Stake blinds are left unbushed in this area, but farther north in Currituck Sound, this type of blind is always camouflaged with brush or reeds. Though less frequently used, low profile boats specially built for waterfowl hunting (below) work well when camouflaged, and are easily moved to other locations.*

***A hunter waits for** incoming waterfowl at dawn in a curtain blind (right). Because they are more trouble to build, and must be permanently stationed on the bottom to be legal, these blinds are not as common. They are, however, very productive in open water. The lattice-like structure surrounding the blind dampens incoming wave action, and a canvas curtain along the rim of the blind can be raised or lowered to adjust to the tides.*

keep it from filling at high tide. The biggest problem with such blinds is that they will pop out of the ground on high water unless they are anchored in some way. The best course is to build them early in the fall, fill them with water and let the marsh settle around them. They can be pumped relatively dry before the season opens.

Another big category is the boat blind. You can build add-on sides for just about any old hull and tow it to a spot where you can anchor it and shoot out of it. Flat-bottomed boats are more stable. Exquisitely functional duck boats are designed for one or two gunners. Often they are decked over and have lathing to hold vegetation. You sit leaning way back or lie down in the anchored boat, then sit up to shoot. Such craft are especially effective for diving ducks in deep water, but can be pulled up on shore anywhere for puddlers and geese. As a blind, their greatest advantage is mobility but they can be expensive. Patented models easily run over $2,000.

The Outer Banks curtain blind is unique. It is also unfortunately called a sink-box, from the now outlawed sink-box, which was a floating rig that could be sunk to the gunwales with iron decoys and sculled up on rafts of ducks. The curtain blind is not movable and is perfectly legal, but is not in wide use because of its expense and difficulty of installation.

Component parts are a reinforced concrete box, the curtain and the wing. This heavy structure — just big enough for two men side by side — is loaded on a boat and transported to a reef where the water at average tide might be a foot or two deep. There it is sunk by digging and pumping. A wooden insert like a plywood liner fits inside the box. Canvas is attached to it and to wooden pieces, which are in turn attached with bolts set at the top of the concrete box. This curtain gives the blind its proper name and makes a flexible seal against water. The wooden top with the curtain can be raised and lowered with the tide so that it is just an inch or two above the surface. Hunters sitting down are completely beneath the water level. They look out over the wing — a moveable, anchored framework of wooden slats that dampens any seas that might otherwise lap over the curtain. This wing is dressed with several feeder decoys, tails in the air. Beyond it is a raft of decoys on their lines.

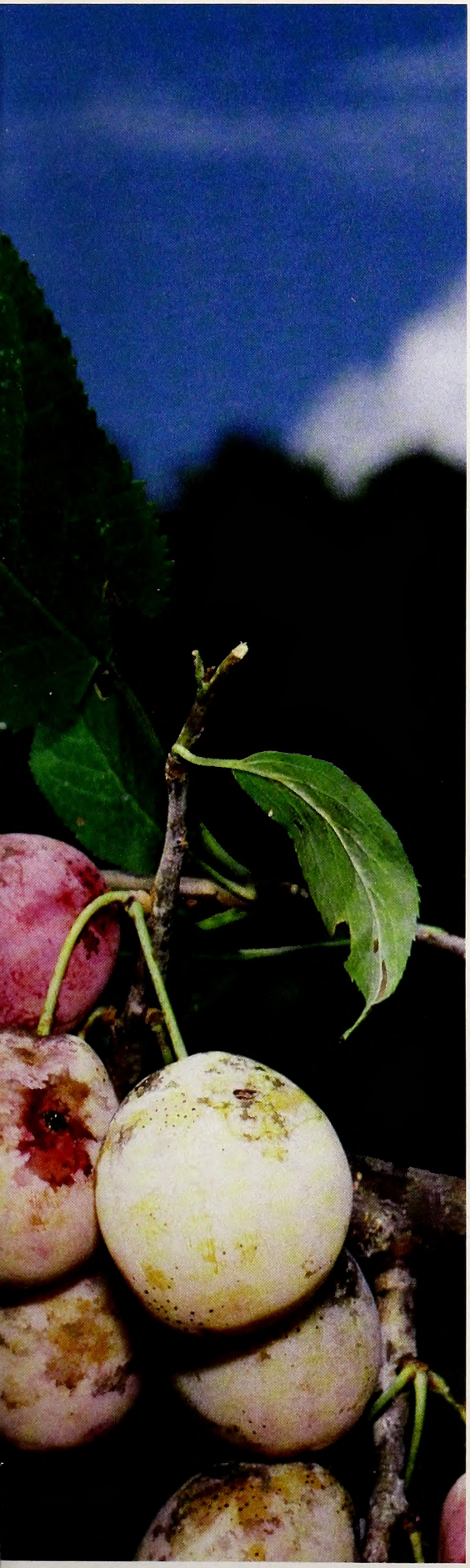
Thurston Gaskill guided for about 60 years at Ocracoke. Before first light, we would depart a sound-side creek, headed in the blackness to Legged Lumps a mile into Pamlico Sound. Towing a small skiff full of home-made decoys with a bigger skiff, he would steer unerringly to a completely submerged curtain blind. Only decoys on the wing emerged. How he found it, I will never know.

Then Capt. Thurston and his helper, often a relative, would raise the curtain and bail the box either with buckets or, in later years, with a gasoline pump. Throwing a couple of wooden crates on the floor, he would invite his clients to get into the box while he put out the decoys. One morning he put out 70 homemade canvas goose decoys as well as scores of uncounted duck decoys. Guests might volunteer to help, but Thurston was particular about how the blocks were placed and hard to please. When everything suited him, he took the small skiff, ran to his big boat and motored off out of sight. From a half mile away, he watched with binoculars. If you shot any birds, Thurston or one of his helpers would come to retrieve.

Gaskill's setup was consistently effective because he had paid attention to the basics —finding where ducks use and laying low until they show up. After that, how you conceal yourself depends on where you are, what you're after, and how comfortable you want to be.

The bush blind *(below) is perhaps the most popular permanent blind in use in North Carolina, particularly along the coast where it is often constructed on a marshy point. It is also used effectively where permitted on inland waters in lakes visited by enough waterfowl to make its construction worthwhile. The hunter is retrieving a black duck.*

Pit blinds like *this one rigged out for snow geese and swans (left) are highly effective for waterfowl species that feed in fields. The blind, wood or fiberglass, is set in a ditch or pit dug in the field. Such blinds are traditionally popular around Lake Mattamuskeet, and were even more common when Canada geese wintered here in much greater numbers.*



When Nature Sets Her Table

Autumn's harvest moon rises over a season of abundance that yields a rich and varied crop for all living creatures.

written and photographed by Harry Ellis

As fall advances, there is ripeness in meadow, field and woodland as autumn bountifully sets her table for wildlife and man with a delicious and colorful array of wild fruits, berries, and nuts. This is nature's finest hour, a season come to maturity and fulfillment, the climax of the year's effort. The miracle of life that persists through the fruit and the seed is evident on every bush and bough and down in the grasses beneath.

For many forms of wildlife this is a period of hurried activity as the feasts and harvests begin. Trees scatter acorns, hickory nuts, and beechnuts throughout the forests, while luscious wild fruits and berries ripen on twig and vine. Woodchucks and other hibernating mammals gorge themselves and build up heavy reserves of fat before retiring to underground dens. Foxes, raccoons, opossums and white-tailed deer also partake of the abundance. Gray squirrels hide their caches deep under the leaf-mould of the forest floor. Chipmunks and white-

Ripening Wild Plums (Prunus americana) *beckon birds and other wildlife in autumn. The fleshy fruit is sour, but it's eaten by many birds. The common snail (above) feeds on a scarlet Hygrophorus mushroom.*

footed mice scuffle through the new-fallen leaves to gather in the harvest, eating some and storing large quantities for the lean days ahead.

Most of the wild berries ripen fully when life is streaming southward on a million wings. Many of these migrating birds stop along the way to replenish their supply of energy. Feeding heavily upon native berries and fruits along their routes, they go south well fed. Many of these wild berries persist well into the winter, gleaming on the bare branches long after the leaves have fallen and purple shadows lie softly on the fallen snow. Without this remnant food supply to nourish the vital spark of life, many of our nonmigrant birds would not survive the winter. But with loads of glowing fruits and berries thrust high above the snow, they have been adequately provided for.

I am not sure that our winter residents —the cardinals, jays, bobwhites, grouse, and many more — are less fortunate than those that fly to warmer climes, for the migrants are beset by many new dangers and perils from the time they depart until their return in the spring. Violent storms and gales drive them from their courses and take a heavy toll. And their enemies, the hawks and other predators, also migrate. Escape from the northern cold may mean the facing of unknown and still greater hazards. In this case we are reminded of Hamlet's probing question as to the wisdom of fleeing from the ills and dangers around us, if by doing so, we "fly to others that we know not of."

Since pioneer times, wild fruits have been extensively used by man, playing an important role in the development of our country. The early colonists regarded these wild foods as manna from heaven, and gathered and stored them away for the long, hard winters that they were to face. Though today we depend much less upon wild fruits than did our forefathers, there is still much enjoyment, amid the splendors of the autumn season, in seeking out and harvesting them.

Often in years past, whole families went berry-picking together, carrying large pails and buckets. There were wild raspberries in the thickets and ripe blackberries hanging in heavy clusters. Low-bush blueberries grew on the high, rocky ridges, a habitat also favored by rattlesnakes, but many braved the dangers and returned with buckets filled to the brim. The discomforts were many, but thorns and poisonous snakes were forgotten over raspberry jelly and hot biscuits, a blackberry cobbler, or a blueberry pie.

Children went into the woods with baskets to gather the sweet and edible hickory nuts, walnuts, chinquapins and chestnuts that were so plentiful in

Wild blackberries *(far left) are a treat for many wildlife species. Autumn berries are an important food source for migratory birds that recoup their strength along their grueling passage to winter homes. Greenbrier or catbrier berries* (Smilax glauca), *above, and low-bush blueberries, below, feed wildlife. The blueberries grow on rocky ridges where rattlesnakes are also found.*

bygone days. The ill-fated American chestnut has now almost wholly vanished from the scene, with only a few of their whitened skeletons still standing to remind us of their former glory. They were brought down like a slaughtered army before the ravages of an Oriental blight that, after its detection in 1904, spread like wildfire throughout the forests. Never again will the delicious and appetizing nuts shower to the ground on the October winds as they once did. I remember autumns of long ago when as a small boy I went with my father into the woods to gather chestnuts. It's an experience that my own grandchildren will never have.

With the passing of the chestnut trees, their place was largely taken by various species of oak. Many kinds of wildlife that relied primarily on chestnuts have adapted favorably to the changed conditions and now depend substantially upon acorns and other types of hard mast, such as hickory nuts and beechnuts. Black bears, deer, squirrels, wild turkeys, and a host of others, are particularly fond of acorns during the autumn season. The fates, fortunes, and future abundance of many species of wildlife are directly related to the size of the year's mast crop.

For reasons that are not quite clear, the acorn crop on certain years is sporadic or fails altogether, and at these times there are mass-migrations of many

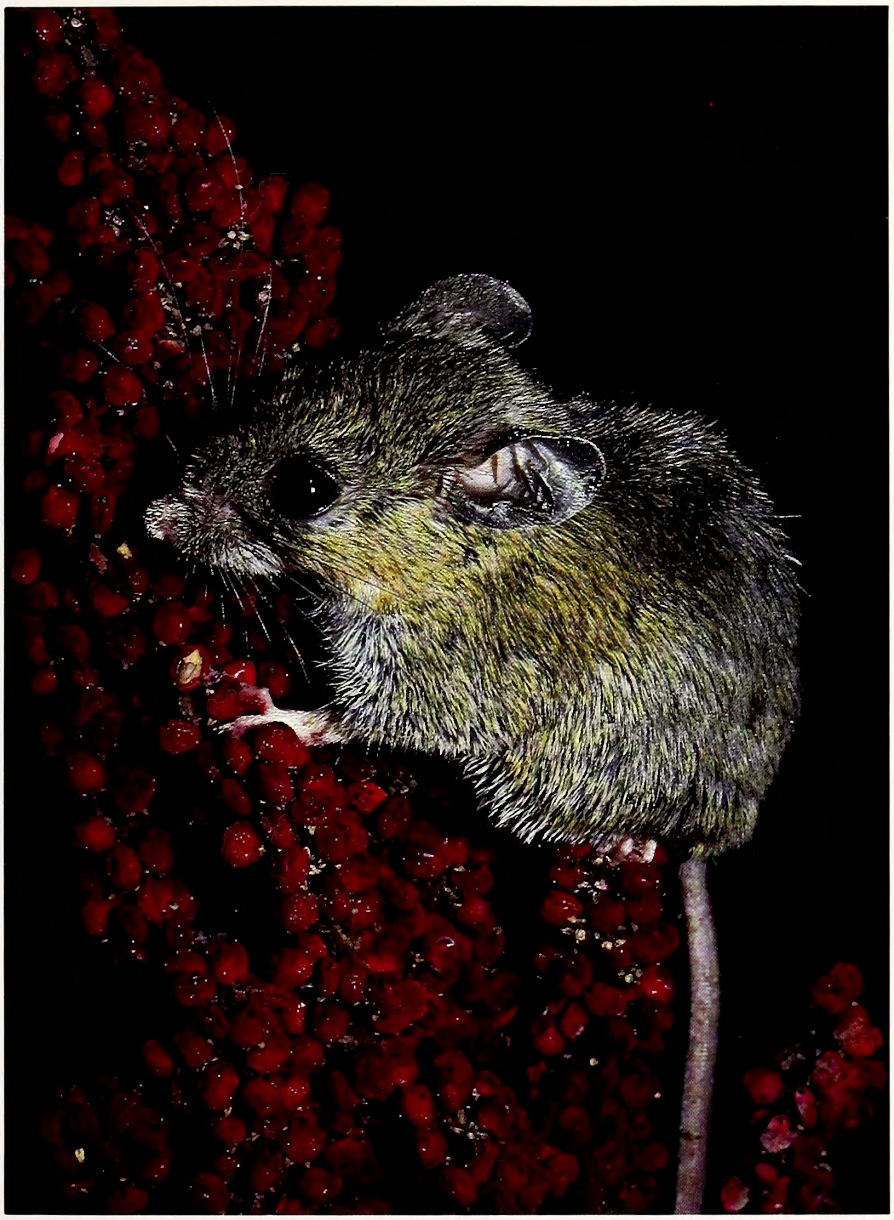
The American chestnut (Castanea dentata), *above, was once the prime mast crop of the Appalachian forests, supporting a host of wildlife. When a blight killed the chestnut trees, their place was taken by oaks, including the white oak (right) whose highly caloric acorn is sought by bears, deer, squirrels and wild turkeys.*

forest animals. Arthur Stupka, former park naturalist of the Great Smoky Mountain National Park, reported that during one such year, there was a mass-exodus of black bears from the Park in search of acorns, and that many never returned. As much as half of the Park's bear population may have died. In some areas, observers told of seeing gray squirrels swimming streams and rivers in their frantic search for other food sources.

The mast of beech trees ranks high in importance as food for wildlife, and in the old days hogs were turned out in the woods to fatten upon it. And it was on ripe beechnuts that the vast flocks of passenger pigeons once fed. Their numbers were so immense that when they took wing, as Audubon wrote, "the light of noonday was obscured as by an eclipse" with a sound that reminded him of "a hard gale at sea." They are gone from us forever, swept away by advancing civilization. But on certain Indian Summer days, when a little of the sweetness of spring is creeping back over our blue, misty hills and a gentle west wind is blowing, visions come to mind, like a shadowy dream, of that "lost wild America."

Each week of the advancing season brings new varieties of ripening fruits and berries. Wild grapes, hanging lush and purple on the climbing vines, are relished by ruffed grouse and many other wild creatures, while red, torchlike clusters of smooth sumac berries, favored by white-footed mice and other small rodents, stand by roadsides and in thickets. At high elevations in our mountains there are spectacular displays of American mountain ash (*Sorbus americana*), with large, intensely colored, scarlet fruit clusters adorning the trees. They are heavily consumed by birds and other forms of wildlife, including black bears that sometimes strip the bark from the trees trying to reach them. Partridge-berries on creeping vines are sought after by bobwhite and grouse that will dig down under the snow to get them; and the bright-red berries of American holly are spread as a feast for the more than 40 species of songbirds that are known to eat them.

Everywhere there is the fruit of wild cherries, flowering dogwood, viburnums, hawthorns, and winterberries. Wild plums ripen in thickets and wild cranberries redden in the bogs. Glossy-black pokeberries, poisonous to man but eaten by all kinds of wildlife, dangle on their ruddy stems. Fat, bright red bunches of jack-in-the-pulpit berries stand erect in the swampy woods and by the winding brooks, where also grows the spicebush with glossy-red berries ripening amid its yellow autumn leaves. Then there are the wild edible mushrooms. Springing up almost overnight in fields and woodlands, they have an esteemed place on Nature's banquet table.



The white-footed mouse (Peromyscus leucopus) *is a gluttonous feeder on sumac berries. Fruits that are not eaten fall to the ground and rot, leaving their seeds to germinate in a future spring.*

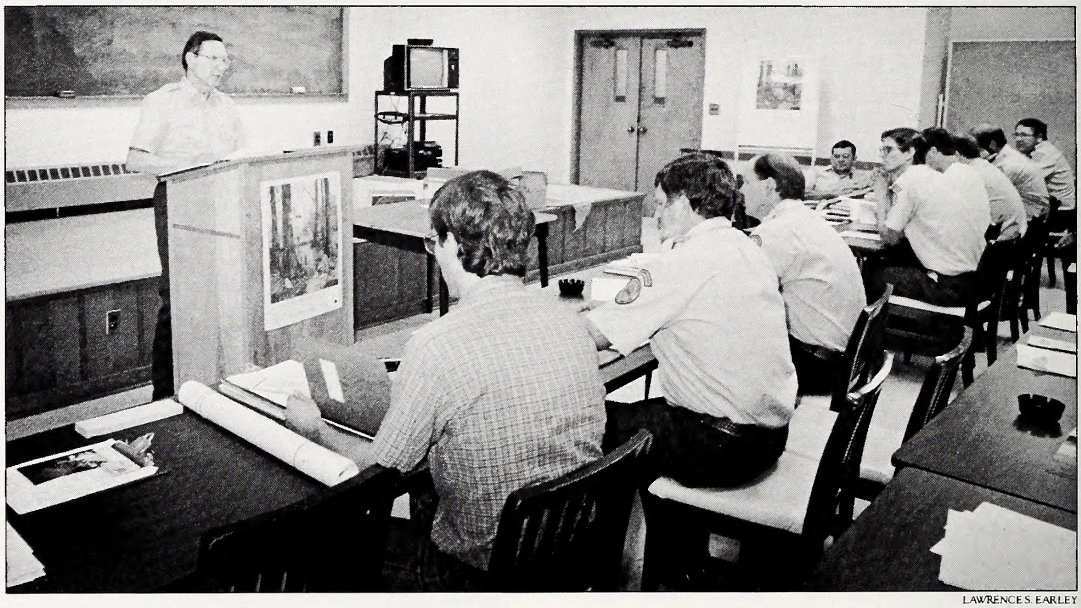
Those fleshy fruits and berries that have escaped the hungry foragers of the wild eventually fall to the ground, shrivel and decay. But the seed itself, with its mysterious germ of life, is stubbornly resistant to the forces of death and disintegration. Besides, nature is lavishly extravagant when it comes to seeds. A thousand seeds to achieve one seedling — that is her plan. She fills an oak tree with acorns so that one, or a few, may fall on fertile soil, send down a root, and thrust up another mighty oak.

Only through the miracle of the seed, that passes its indomitable genetic spark from the old generation to the new, can these higher forms of life endure beyond a single season — to the time of their rebirth every spring, through the maturity of summer growth, and once in the course of each year's wheeling cycle, to that season of mellow mists and golden harvests, when, for wildlife and man, autumn again sets her banquet table. ⊠

Focus On Habitat Conservation

Wetlands Training Takes Biologists Back To School

Written and Edited by Mark Taylor



LAWRENCE S. EARLEY

***Sharpening Skills**: Commission wildlife and fisheries biologists learn more about identifying and protecting wetlands from Don Baker, program manager of the Wildlife Commission's Habitat Conservation Section.*

Wildlife Commission biologists will be better able to protect North Carolina's diminishing wetlands thanks to special training from federal and state wetlands experts.

That's the judgment of wildlife officials after 50 fisheries and game biologists assembled last summer at the N.C. Forest Service training facilities at Crossnore in Avery County for three days of schooling in wetlands identification and reporting. The workshop was planned by Don Baker and Dennis Stewart of the Commission's Habitat Conservation Section.

"Increasing development in North Carolina has put pressure on wildlife and fisheries habitats," said section manager Baker. "And one of the most valuable of habitats— wetlands—is often the most seriously affected."

The biologists went to school, said Baker, because the state's permit-review process enables the Wildlife Commission to comment on the effects of numerous development activities on fish and wildlife. These activities may include highway projects, county land-use plans, dam construction, new mines and other development that may destroy habitat.

"The Habitat Conservation Section is required to comment on about 800 projects a year that may involve habitat degradation," said Baker. "Our one field investigator is simply snowed under, so more and more we've been asking district biologists to help out with site visits. We wanted to make the biologists a little more knowledgeable not only about wetlands, but about the Commission's jurisdiction and authority."

Biologists spent the first day learning how to use soils, vegetation and the degree of site wetness to identify a wetland. John Hefner, U.S. Fish and Wildlife Service wetlands specialist from Atlanta, explained the classification system employed by the National Wetlands Inventory.

On the second and third days, state and federal officials explained their roles in the process of wetland protection and the biologists also studied the Commission's newly developed Guidelines for the conservation of wetlands and aquatic habitats. These guidelines establish policies and procedures that standardize the Wildlife Commission's environmental-review process.

"We want to give everyone in the state the same criteria to work with," Baker said, "so that when biologists in the mountains and on the coast are reviewing a project, they are using the same policies and criteria."

— Lawrence S. Earley

Old Hunting And Fishing Photos On Display

Sporting Heritage Featured At State Fair Wildlife Exhibit

Did you ever wonder what hunting and fishing were like in North Carolina when your grandparents were young, or even earlier than that?

If so, be sure to stop by the Wildlife Commission's exhibit at the North Carolina State Fair in Raleigh, which runs from October 14-23. The exhibit chronicles the history of wildlife in North Carolina — beginning with early settlers such as Daniel Boone, continuing through the days of market hunting for waterfowl on the coast, and ending with the restoration and protection of our wildlife which began in the 1930s and continues to this day. The exhibit is not the only attraction, however. Hunter safety, live fish in aquariums, and a natural habitat will also be featured.

"We think everyone will enjoy this exhibit," said Don Tobaben, state fair coordinator for the Wildlife Commission. "North Carolina has a fascinating past, and wildlife has always played an important part in our lives."

The Wildlife Commission's tent is located near the Village of Yesteryear. Subscriptions to *Wildlife in North Carolina* magazine and wildlife calendars will also be available at the exhibit.

Book Reviews

Bluefishing, Hiking Info

Bluefishing by Henry Lyman. Published by Nick Lyon's Books, 31 West 21 Street, New York, New York 10010. 160 pp. Available in hardcover ($16.95) or paperback ($8.95).

October means bluefish to many anglers along the eastern seaboard, and anything an angler needs to know about "snappers" or "choppers" is in this book. *Bluefishing* not only covers all of the major angling methods for catching blues, but also has detailed information on their life history. Lyman was the founder and longtime publisher of *Salt Water Sportsman* magazine, and provides a nice mix of scientific knowledge and up-to-date information on fishing techniques along with observations gleaned from decades of fishing. It makes for good reading.

North Carolina Hiking Trails by Allen de Hart. Second Edition. Published by the Appalachian Mountain Club, 5 Joy Street, Boston, Mass 02108. 508 pp., softcover. $14.95. Available from publisher or through local bookstores.

Reach into any Tar Heel hiker's pack, and you will probably find a copy of Allen de Hart's *North Carolina Hiking Trails.* The first edition was an excellent hiking guide, and in this expanded second edition he has included new trails and added sections on the Mountains-To-The-Sea Trail and the Great Smoky Mountains National Park.

Calendar Of Events

October 1
Folklife Festival at Latta Place in Huntersville. Traditional music, dancing and crafts.

October 1-2
North Carolina Seafood Festival in Morehead City. Seafood, arts, crafts and other events.

October 8
Mullet Festival in Swansboro. Mullet dinner, parade, and other events.

October 8-9
North Carolina Oyster Festival in Shallotte. Events include oyster roast and cook-off, flounder fry, and tall tales contest.

October 9-14
Colonial Living Week at the Alamance Battleground State Historic Site in Burlington. Living history demonstrations of 18th-century domestic and military life.

October 14-23
North Carolina State Fair at the State Fairgrounds in Raleigh. Educational displays by the Wildlife Resources Commission and N.C. Department of Natural Resources and Community Development, livestock exhibitions, and much more.

October 29
Fifth Annual Lexington Barbecue Festival in Lexington. Parade of pigs, entertainment, and of course lots of barbecue.

Field Notes

Season openings, closings, and regulation changes:

Rails, moorhens and gallinules	Open through Nov. 11
Mourning doves	Sept. 3-Oct. 8 (all day) Nov. 23-26 (all day) Dec. 19-Jan. 7 (all day)
Eastern bow and arrow deer	Closes Oct. 8
Eastern muzzleloading deer	Oct. 10-15
Eastern gun deer	Oct. 17-Jan. 2
Central bow and arrow deer	Closes Nov. 5
Northwestern bow and arrow deer	Closes Nov. 12
Western bow and arrow deer (see regulations for Yancey County)	Sept. 12-Oct. 8 Oct. 17-Nov. 19
Western muzzleloading deer	Oct. 10-15
Western bear season	Oct. 17-Nov. 19 Dec. 12-Jan. 2
Wild boar	Oct. 17-Nov. 19 Dec. 12-Jan. 2
Gray and red squirrels	Oct. 17-Jan. 31
Fox squirrels (where open)	Oct. 17-Dec. 31
Grouse	Oct. 17-Feb. 28
Western raccoon and opossum	Oct. 17-Jan. 31
Eastern raccoon and opossum	Oct. 24-Feb. 28

Information on bag limits, either-sex hunts and other regulations may be found in the 1988 *North Carolina Inland Fishing, Hunting and Trapping Regulations Digest.* Information on waterfowl regulations is available from license agents.

The 1988 North Carolina Wildlife Calendars Are Here!

With such artwork *as Robert B. Dance's "Hatteras Standing" featured above, the N.C. Wildlife Calendar is sure to be a success! "Hatteras Standing" is one of the six paintings chosen in the first National Arts for the Parks contest.*

The work of Larry Barton, Duane Raver, Robert B. Dance, Alan Cheek, Bob Timberlake, Bob Herr, Bob Henley, James A. Brooks, Ronald J. Louque, Louis Frisino and Judy Johnson McPherson are featured in the 1989 Wildlife Calender.

Order yours today by returning the form below with your check or money order to: 1989 CALENDAR, N.C. Wildlife Resources Commission, 512 N. Salisbury Street, Raleigh NC 27611.

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For fund raising and bulk rate information (10 calendars or more), call 919-733-7380. Please allow 4-6 weeks for delivery.

CALO 89

Weighs 4 Pounds, 6 Ounces Record Shellcracker Caught

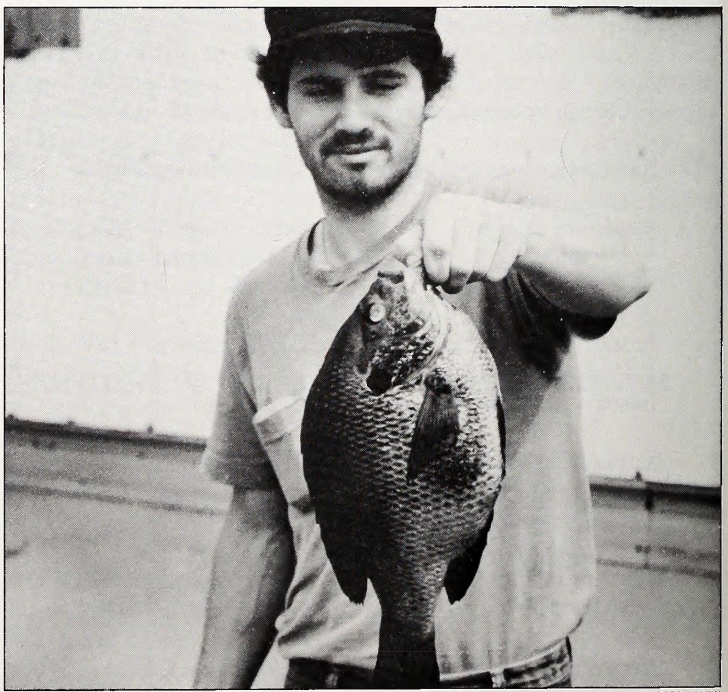
Randal Sweet of Hiddenite had a surprise waiting for him one day last summer when he waded across the Catawba River below the Oxford Dam to cast to what he thought was a feeding bass. The fish that struck his green Roostertail was not a bass, however, but a redear sunfish or shellcracker —and a new state record as well. The 15-inch fish weighed 4 pounds, 6 ounces with a girth of nearly 17 inches.

"I fought that rascal for about 20 minutes before I landed it," Sweet recalled. "When the fish hit the lure and turned I could see its color was wrong for a bass. Then it ran downstream with the current, so I let the drag off and let it run. Then, I'd slowly work it back and it'd take off with the current again. I couldn't believe the size of the fish, but knew it was some type of bream."

Sweet often fishes near the Oxford Dam area, which is located just above Lookout Shoals Reservoir. He usually fishes green Roostertails on ultralight tackle, and catches bass, bream and white bass. Previously, his largest bream had weighed 1½ pounds, and an average "good fish" weighed a half-pound.

Lookout Shoals Lake is known for producing big shellcrackers, and area fisheries biologist Joe Mickey is not surprised that the new record came from its waters.

"There is a large population of Asiatic clams in the lake, so the shellcracker have plenty to feed on," he said. "In fact, we've caught several shellcrackers weighing about 2 pounds in our recent surveys of the lake."



JOE MICKEY

Record 'Cracker: *Randal Sweet of Hiddenite holds the new state record shellcracker or redear sunfish, a 15-inch fish he caught from Lookout Shoals Lake.*

Hunter Orange Now Required

If you go big-game hunting this fall, don't forget your orange — not the fruit, but the color. State law requires that hunters using firearms (including muzzleloaders) must wear a hat or other outer garment of blaze or hunter orange visible from all sides when hunting deer, bear or wild boar.

"Wearing blaze orange is one of the safest things a hunter can do," said Colonel Harold Ragland, chief of the Wildlife Commission's Division of Enforcement. "Experience in other states shows that it nearly eliminates accidents where hunters are mistaken for game, or are not seen and in the line of fire. Although blaze orange is not required for small-game hunters, we also urge them to wear it. It's easy to lose track of other hunters when you're quail or rabbit hunting in thick cover.

Ragland also offers several other tips to improve the safety of your hunt. Guns should be loaded only when you're actually hunting. Never carry a loaded gun in a vehicle or into a house or camp. Unload firearms before crossing obstacles such as fences, and if you're using a tree stand unload the firearm first and then pull it up to your stand after you've climbed up and secured yourself with a safety belt.

Always control the direction of the muzzle so that it is not pointed at anyone. Be absolutely sure of your target before you shoot, and be sure that people, livestock or buildings are not in the line of fire or the background. And of course, never drink alcohol before or during hunts.

"Much of this is common sense," said Ragland. "Statistically hunting is one of the safest sports, but everyone needs to be very careful."

Quick To Prepare

Broiled Kings Fit For Royalty

King mackerel are not only fun to catch, they're good to eat and broiling is one of the simplest ways to prepare them. Cut the fish into ¾- to 1-inch steaks (crosswise between vertebrae, not lengthwise). Figure on at least one steak per person.

Basting Sauce

1 stick of butter
lemon juice (1/3 amount of melted better)
soy sauce
paprika

Set oven on broil, and cover bottom of broiling pan with water (this will keep the fish from becoming dry, and makes the pan easier to clean). Baste steaks with basting sauce, and broil until fish is white on one side (about 5 minutes). Remove fish from oven, and baste both sides. Turn over, and sprinkle top with paprika. Broil until fish is cooked through (this takes no more than 5 minutes, check often and test for doneness with fork). Remove fish, and baste with sauce and fresh lemon juice before serving. Excellent with brown rice, salad, and a pitcher of iced tea.

— *Mark Taylor*

Bottomland Print Offered

Proceeds from the sale of these prints will be placed in the Nongame and Endangered Wildlife Fund which supports a variety of nongame wildlife projects and the purchase of wildlife habitat in North Carolina. Each poster-sized, numbered print bears the North Carolina State seal, Governor Martin's signature, and the artist's signature.

The Nongame Print makes a great holiday gift. **To receive your print in time for the holiday season, your order must be received by December 9.**

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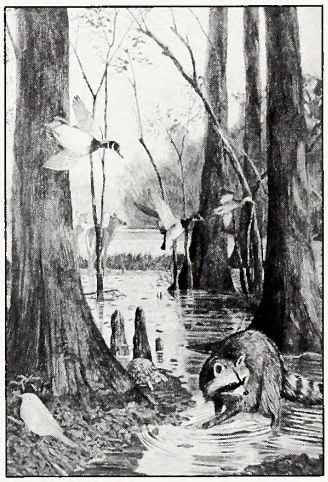

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The Wildlife Endowment Fund Report

The Wildlife Endowment Fund is supported by the sale of lifetime licenses, lifetime subscriptions to *Wildlife in North Carolina*, and tax-deductible contributions. Only the annual interest from this fund is used for wildlife conservation, and the fund will play a key role in supporting wildlife programs in the future. Interest is earned through investments made by the State Treasurer's Office. For more information, write to the Wildlife Endowment Fund, N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27611.

Status on July 31, 1988

	Numbers Sold	Revenue Received
Lifetime Sportsman's License	44,926	$14,773,620.13
Lifetime Hunting License	325	81,768.37
Lifetime Fishing License	3,462	675,630.56
Lifetime Subscriptions to Wildlife in N.C.	1,391	180,190.37
Contributions	—	114,466.99
Fund Total	50,104	$15,825,676.42
Total Interest Earned	$3,154,004.53	

Our 50th-anniversary book — *Wildlife in North Carolina* — was a holiday hit last year!

Here are 16 reasons why:

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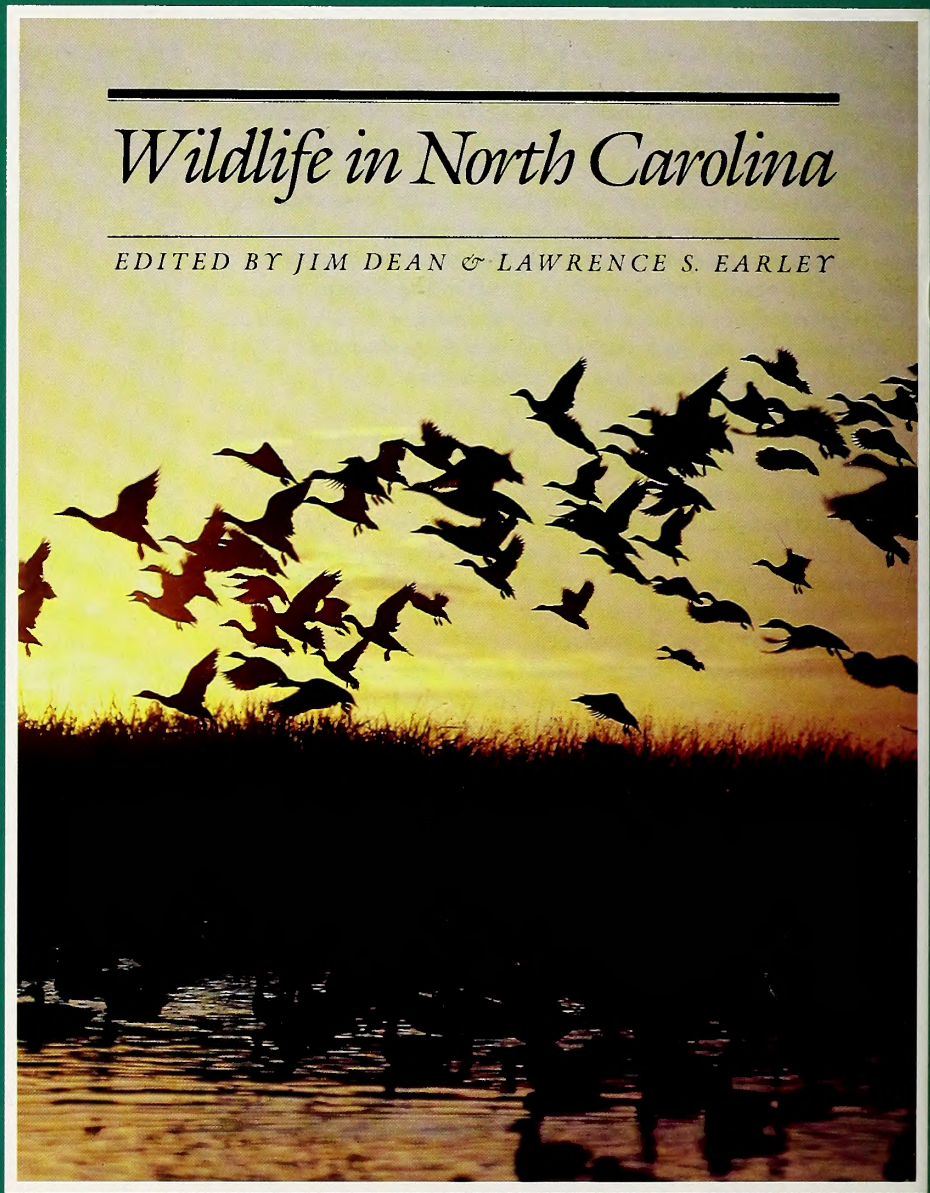
There are 25 other reasons you'll love this big book brimming with stunning color photographs.

The perfect gift for anyone who loves the North Carolina outdoors!

Published by the N.C. Wildlife Resources Commission and the University of North Carolina Press. Hardbound copy is $24.95 at bookstores everywhere. Or order direct using the special order form below.



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Give the holiday gift that lasts a lifetime—a lifetime subscription to *Wildlife In North Carolina* or a lifetime license (see form at left).

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Autumn Angler

In the glory of an October dawn, a fisherman admires a largemouth bass while wading the edge of a lake.

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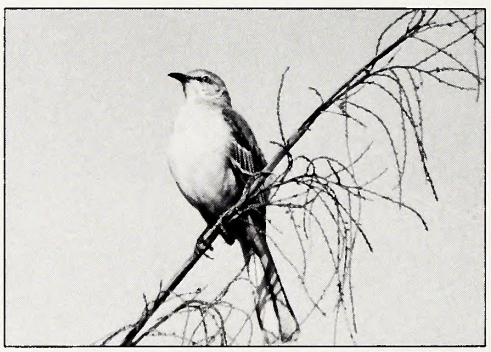
NOVEMBER, 1988 75 CENTS

Playing A "Nongame" To Win

by Jim Dean

What's in a name? As that old song suggests, you could ask any boy named Sue and get a pretty good idea. For that matter, look at the money and time spent to find just the right name for a new automobile. We don't buy an automobile anymore, we buy an image. We may hate it, but pegging advertising to a person's image has become a predictable science, and the practitioners know us better than we know ourselves.

If you think your tastes are so simple they're immune from manipulation — think again. Your maverick anti-consumer streak simply wedges you firmly into one of the more predictable categories of buyers — the kind of person, for example, most certain to buy a business model sedan or white, unscented toilet paper. Yep, selling the right image can be a demeaning mix of hype and pizzazz, but we seem to be uncommonly eager victims. Maybe that's because pizzazz can sell good products as easily as it sells those we might not need.



LEONARD LEE RUE, III

With that in mind, I've got a name for you to think about. Nongame. Sounds like a word a losing coach would use, doesn't it? "Yep, our squad played a nongame and got massacred by six touchdowns."

Do you know what nongame is? Would you buy one? I think you see the problem. Briefly, the term "nongame" is used to describe all the countless species of wildlife that are not considered "game." Game species are those that are sought by hunters, trappers and fishermen, and for which there are legal seasons and limits. White-tailed deer, bobwhite quail and largemouth bass are game species. Flying squirrels, mockingbirds and snail darters are nongame species.

Why is this distinction important? While it may seem ironic to some, populations of most game species are in good shape, and some like mourning doves and deer have never been more abundant. That's partly because sportsmen have historically taken special care of the species they love, and paid enormous sums of money through licenses and taxes to do so. That's also why so much has been written recently about the drought, dwindling nesting habitat and the decline of waterfowl species. Sportsmen are scrambling to find a way to boost the populations of these game species.

In the past decade or so, major programs have been undertaken to provide similar support specifically tailored to nongame species, especially those on the federal list of endangered or threatened species. Happily, this quest for improved management and research for nongame species has brought sportsmen and those who neither hunt nor fish together in a common goal.

Across the nation, agencies like our N.C. Wildlife Resources Commission have launched major cooperative programs to help nongame, threatened and endangered wildlife species. In North Carolina, state and federal agencies and private groups have already made an impact — helping reestablish peregrine falcons, and finding ways to restore populations of loggerhead turtles, brown pelicans and others. Many projects are under-way, some for species as rare and obscure as the spiny mussel, others for species as recognizable as our national symbol, the bald eagle.

Money for these efforts has come from varied sources, but one of the most successful programs has been the tax checkoff — a way for tax payers to donate a portion of their tax refund to be earmarked especially for use in helping nongame species. Since 1984, $1.7 million has been generously donated by citizens in North Carolina alone, but it's far less than will be needed in the years to come.

Nationwide, this superb effort on behalf of nongame species is gaining ground all the time. And yet, there are many who believe it needs a shot of pizzazz.

Readers of *Wildlife in North Carolina* and those who work on these projects daily are familiar with the term "nongame." But even many knowledgeable wildlife lovers find the term confusing, and the vast majority of people have no earthly idea what nongame is.

"It's tough to sell a program — even a truly worthwhile program — when it's handicapped by its very name," said Randy Wilson, head of the Wildlife Commission's nongame program. "People involved in this effort have tried to find a more jazzy title for it, but so far we haven't come up with anything."

So here's a challenge for you. Maybe you can come up with a descriptive word or phrase for "nongame" that's not so drab — one that will help sell a truly good cause. Send your idea on a postcard or in a brief letter to us here at *Wildlife in North Carolina*, and if we get enough of them, we'll publish some of the more interesting ones in an issue next spring along about income tax time. Maybe your idea will help generate more contributions to the income tax checkoff.

And even if we're stuck with nothing more exciting than "nongame," at least a few more folks will know what it means. But dang it all, a little pizzazz couldn't hurt.

November, 1988
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WILDLIFE IN NORTH CAROLINA

Wildlife in North Carolina is the official educational publication of the North Carolina Wildlife Resources Commission, and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources and the environment we share with them.

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When startled, this *black bear will awaken from his winter's nap and flee. Bears are not true hibernators. Their sleep is more like a long doze. Bears den in hollow trees, rocky caves or beneath the branches of fallen trees.*

Among the non-hibernating *creatures are most mammals and almost all birds. The fox, like all warmblooded creatures, must eat to keep warm. Birds cope with winter by migrating to warmer climates. Only one bird is known to hibernate.*

Woodchucks and chipmunks *store up fat before they hibernate. Chipmunks can sleep deeply for several days but then they awaken briefly and feed. Woodchucks in the Coastal Plain remain active year round, while those in the mountains enter a deep torpor.*

Cold-blooded amphibians, *like the frog, seek deeper and warmer layers of the earth in which to burrow during the winter's cold. Frogs dig into the mud in streams and ponds and can survive on little oxygen until spring.*

Sleepers

written by Lawrence S. Earley / illustrated by David Williams

Extreme cold puts such pressure on living things it's no surprise that animals have evolved many ways of coping with it. One way of handling cold is to move away from it, which is what birds do when they migrate to warmer climates. It's also what earthworms do when they seek deeper soil or what leopard frogs do when they leave the woods for the marshes and stream bottoms. They are using the natural insulating power of soil to keep them warm. Other animals add internal insulation by putting on additional layers of fat and thicker fur coats.

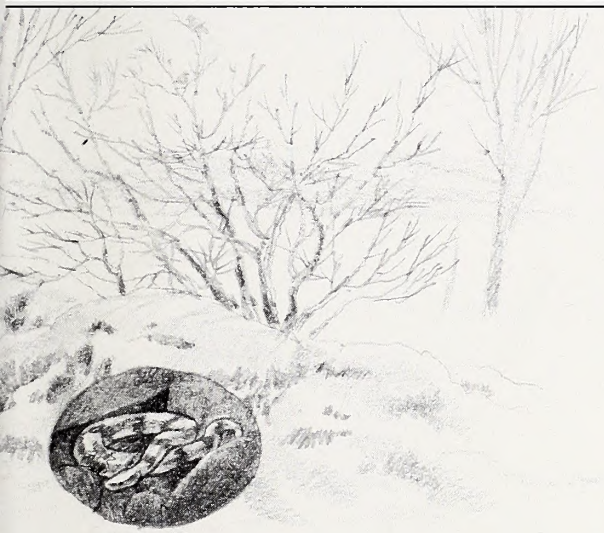
Hibernation is another strategy to cope with winter's rigors. Rather than flee the cold or continue searching for food during the lean times of winter, some animals get out of the rat race entirely. They sleep. Their body temperatures fall and their metabolic rate is reduced considerably. Their food, water and oxygen intakes drop, sometimes radically. The animal dozes lightly or sleeps deeply, depending on the species. True hibernation occurs when the sleep is quite deep and the animal's body temperature is just a few degrees above the outside temperature, but that is quite rare. More common, especially in North Carolina, is a lighter sleep or "torpor" that occurs when the animal's body temperature falls slightly. All hibernators, whether deep or light sleepers, eventually warm and rouse themselves through internal means.

Among North Carolina hibernators are toads, turtles and snakes. Many insects hibernate, crawling beneath tree bark or into rotted wood to sleep the winter. Only a few mammals hibernate: woodchucks and black bears, chipmunks, red squirrels, many bats and the jumping mouse. Their sleep tends toward the light end—they are not true hibernators—and they may easily be awakened. A human moving through heavy underbrush near a bear's den will surely spook the bear. No birds in North Carolina hibernate—in fact, only California's poor-will is known to hibernate world-wide.

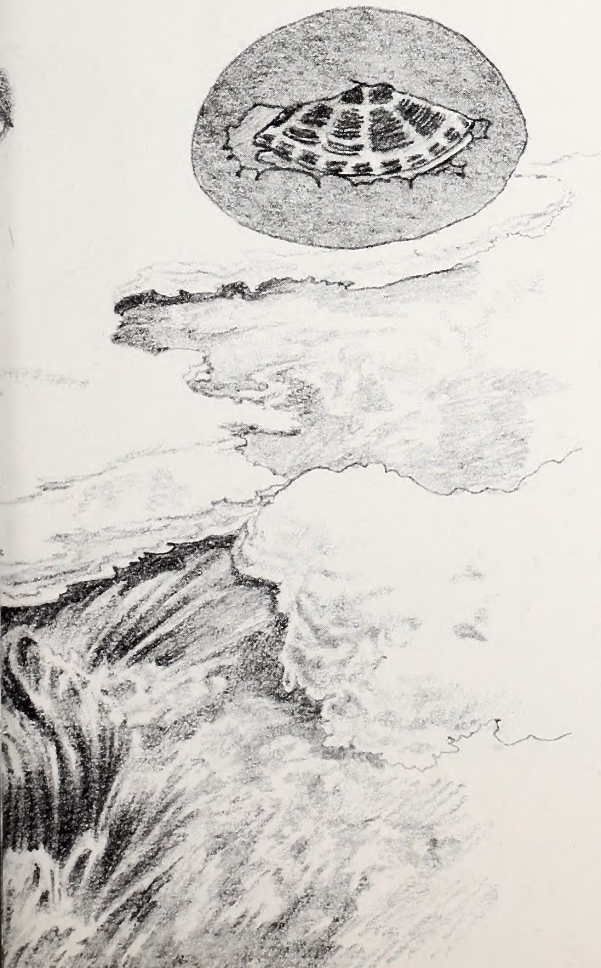
One of the commonest misconceptions about hibernation is that animals sleep completely through the winter, awakening in the first warm days of spring or as the days grow longer. Actually even true hibernators awaken periodically and sometimes move about. Light sleepers such as chipmunks and jumping mice awaken even more often during the winter. During warm periods, bats awaken, feed and even breed before resuming their sleep. Black bears interrupt their winter naps to wander about and browse.

Most mammals stay active all winter; their warm-blooded nature enables them to be independent of the environment. Hibernating mammals are rarities, compared to other orders. Indeed, biologists consider mammalian hibernation a mystery. Consider the fact that hypothermia — or the radical loss of body temperature due to exposure to cold — can be fatal to warm-blooded creatures. Even the loss of a few degrees temperature leads to loss of muscular control in most mammals. Yet the bodies of all hibernators drop at least a few degrees and true hibernators approach 0 degrees C without any toxic effect. And they can rewarm themselves spontaneously. How do they do it?

The mystery only demonstrates that hibernation is a unique response to winter among warm-blooded animals. Most mammals prefer to wander the winter-stricken landscape, searching for ever-diminishing food stores and trying to keep their internal fires burning until spring.



***Reptiles such as the** snake and turtle are also cold-blooded and hibernate during the winter. The cold slows their respiration and their heart rates and they must await the warmth of spring before they can function normally.*



WATERFOWL IN WOOD

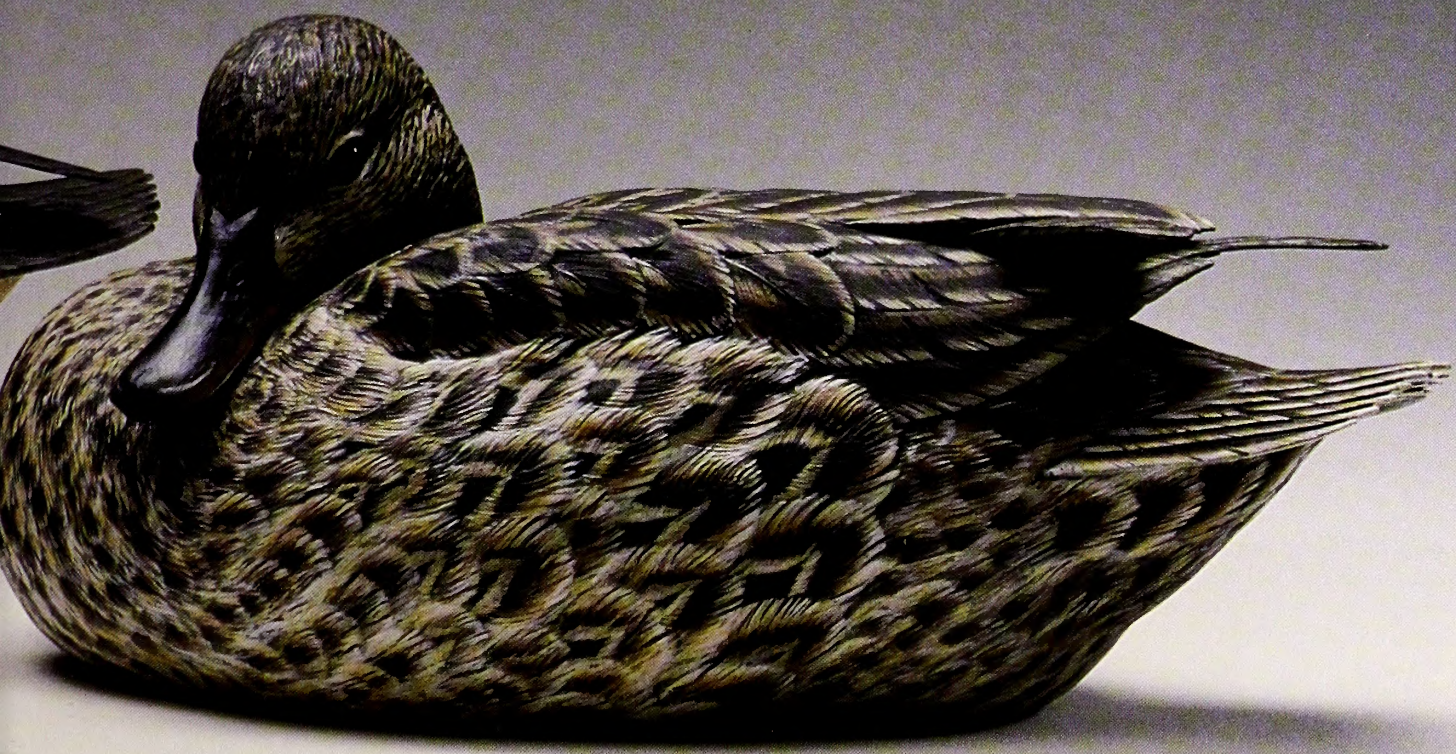
Durham carver Ben A. Heinemann may spend 150 lonely hours turning a block of wood into a duck or goose that will win awards and be avidly sought by collectors.

by Jim Dean / photography by Melissa McGaw

Ben Heinemann is standing in the kitchen of his northern Durham home wearing an apron and cooking a goose. It's late-afternoon and the kids, Ben and Kathy, are at the sitter. His wife, Karen, is teaching physical education at Southern High where she's also girl's volleyball coach.

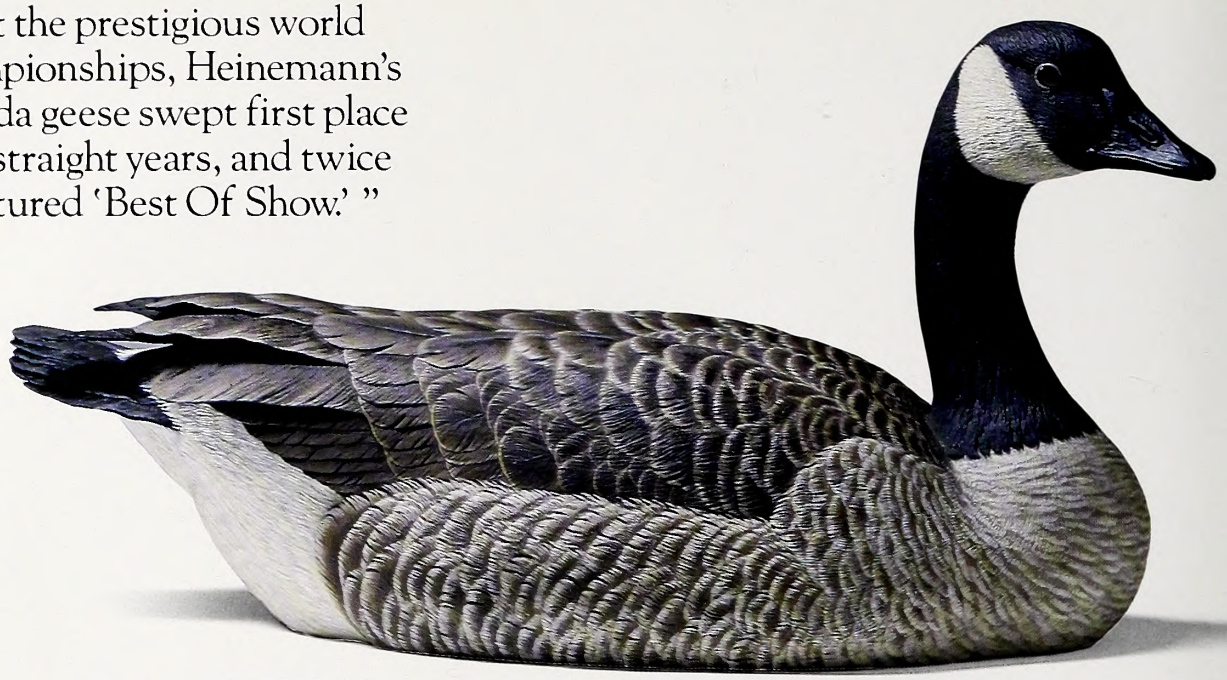
"Coach of the year last year," says Ben proudly as he adjusts the tinfoil tent that fits over the baking pan, and shoves the big Canada back in the oven. Mister Mom is fixing supper. Except for the identity of the bird in the pan and a pair of baby bobwhite quail in a cage on the counter, there are no clues that this 33-year-old part-time home-maker is widely recognized as one of the finest contemporary waterfowl carvers in the world.

At Ocean City, Maryland, in the prestigious world championships where the very best waterfowl carvers compete, his Canada geese have swept first place every year they've been entered—five years in a row. Twice at this competition, his geese have captured "Best Of Show" awards, meaning they were judged not only best in the goose category, but best of all entries regardless of species. At the Mid-Atlantic Waterfowl Festival at Virginia Beach, Heinemann's ducks and geese have taken two first places and a third, and he has lost count of all the other blue ribbons and awards his ducks



Green-Winged Teal

"At the prestigious world championships, Heinemann's Canada geese swept first place five straight years, and twice captured 'Best Of Show.' "



Canada Goose

and geese have won over the years. Serious collectors know Ben Heinemann and seek his carvings.

From the rich aroma in the kitchen, they might also stand in line for a serving of goose, but real birds aren't our interest today. Off comes the apron and Ben leads us into the back yard where we meet his partner, a big friendly black Labrador retriever named Duchess, and begin a tour of his studio-workshop, "The Carving Tree." In this two-story building, Heinemann not only carves and paints his birds, but also teaches woodcarving and painting to groups and private individuals.

Downstairs, we pause at a long work bench covered with shavings, tools and magnum working duck decoys in various stages of completion. Alongside is an olive drab johnboat rigged out for duck hunting.

"I really enjoy making fairly simple working decoys like these black ducks and using them when I hunt,"says Heinemann. "In fact, that's what I do for relaxation when I get tired of working on the others." He nods overhead where the more serious carving takes place.

***Ben Heinemann uses** a special wood-burning tool with a sharp, wedge-shaped point to add final definition to sets of feathers on a drake mallard. Artificial steel wool mounted on a buffing wheel or mandril is then used to polish the wood to clean off any fuzz. A thin brushed coat of lacquer sealer primes the wood for final painting.*

Upstairs, Heinemann hands us a female mallard, its head nodding and one eye half closed as though it were about to fall asleep. It is incredibly light and life-like. A mourning dove and a small songbird share shelf space with the mallard and a pair of wood ducks, but we are a bit surprised to see only a few other carvings in the room.

"I don't keep many around. Can't afford to,"says Heinemann who averages 30 decorative carvings each year. "Once a bird is finished, it goes to the person who commissioned it. Of course, some go to shows first. This is a fulltime job, but I don't have any problem with motivation. Two kids and house payments take care of that.

"On a typical day, I ferry the kids to the sitter and work here from 8:30 until about 5 when I stop to get dinner started. I usually come back here after we eat and work until 10 or 11. I also have yard work to do, and I built this shop. I'm constantly working, it seems, 6 or 7 days a week. Sometimes, I watch TV while I'm working, but I do my best carving to rock and roll music or a good Duke-Carolina game."

Heinemann was born in San Antonio, Texas, but grew up in Bellville and Decatur, Illinois, before moving to Durham about four years ago. "My uncle used to carve miniature decoys in duck blinds while we were hunting, and he got me started when I was about 15," says Heinemann. "At that time, I had a blind on a river in Illinois, and I began to paint or carve a duck head while we waited. I'm a firm believer that ducks will often 'work' themselves, and we'd sometimes have them come to our decoys while we were carving. Once when I was a kid, I was cooking breakfast in the blind and three Canada geese landed in the decoys. We got 'em.

"I used to hunt more before Karen and I had the kids—sometimes five days a week. More recently, I've been deer hunting some and even play a little

White-Throated Sparrow

Mourning Dove

golf, but ducks and duck hunting have always been my true joy, and I've been fortunate to be able to make a life of it."

Before Heinemann began carving professionally in 1975, he was a funeral director, and before that, an insurance agent. But he knew that wasn't what he really wanted to do, and he also felt he had gained enough experience carving and painting decoys to give it a shot as a career.

"I felt I could carve professionally, and I didn't want to waste time working my way up, so I decided to try to start in the top class as a pro,"says Heinemann. "I tried to prepare myself properly. For awhile, I raised my own birds to use as models, and I've shot lots of photographs of birds from all angles to use as reference."

Success came almost immediately at the shows, and demand for his award-winning birds grew quickly. Though his carvings are now mostly commissioned in advance, Heinemann still tries to attend six of the major shows a year, traveling to California, Michigan, Iowa, Easton and Ocean City, Maryland, and Virginia Beach. "I'm so wrapped up in ducks now that traveling to the shows is like a vacation,"says Heinemann.

That's not hard to believe considering how much time he spends alone in the smaller upstairs room next to the studio-office. Even with TV, rock music or a game for company, it's a solitary way to make a living.

"This is where I do most of the detailed carving and painting of commissioned and competition birds," he says, pausing at the doorway. Shavings and dust seem to be everywhere, and the bench is splattered with paint.

"It takes about 150 hours—start to finish—for

Drake Mallard

me to complete a bird," he says. "I start with a block of wood, usually tupelo or jelutong. Tupelo is native to our eastern swamps, and it's a very good, almost grainless wood that holds crisper detail than jelutong. But jelutong, which is imported from Malaysia, has no hard growth rings."

Using a band saw, Heinemann cuts the top and side views of the body blank following his own patterns. The heads are cut out separately. He rounds off the corners with a 6-inch table sander, and uses an heavy-duty, electric-powered Foredom tool with a flexible shaft to obtain the coarse shape he wants. Then, with a pencil, he sketches guide lines and a few key feather outlines.

"I'm strong on anatomy and getting that right," he says. "Birds have sets of feathers, and you get the appearance of movement and a lifelike look by highlighting feather sets."

Once the bird has its basic shape, Heinemann uses a lighter Foredom tool to further detail the sets of feathers, and begins highlighting individual feathers with an even lighter high-speed rotary tool. A woodburning tool is also used in various places to obtain more definition, crispness and greater texture.

After using the woodburning tool, Heinemann gives the bird a light sanding to remove any fuzziness, and gives it a coat of diluted lacquer that works much the same as a sanding sealer.

"Then I paint it using tube acrylics," he says. "It's all done with a dry brush technique. I don't use spray paint or an airbrush. I think the assets my birds have are texture and a certain flowing form and, of course, the paint job. In order for the final piece to work, it's got to have depth, flow and texture."

Hen Mallard

Even someone unfamiliar with waterfowl can appreciate Heinemann's ability to bring a block of wood to life, but anyone who has spent countless icy dawns in blinds will also observe other, more subtle qualities. These carvings evoke the pungent odor of a marsh, reeds rattling in the wind, the sting of sleet, and birds wheeling upwind into the decoys. ⊠

Those interested in obtaining more information about Heinemann's carvings or classes can contact him at The Carving Tree, 906 Cardens Creek Rd., Durham, N.C. 27712.

HUNTING THE TROPHY SWAN

The tundra swan continues to prosper in the Atlantic flyway and along the North Carolina coast allowing a limited number of birds to be harvested by special permit.

written and photographed by Joel Arrington

A decade or more ago, some friends and I were guests one fall in a remote Core Banks fishing camp. One night the owner served us what he said was goose stew. Later another guest took me aside and whispered, "How long is a Core Sound goose's neck."

I said I would guess about 12 or 14 inches.

He said he had secretly tabulated the neck pieces in everyone's bowls and they added up to highly suspicious 24 inches. I gave our host the benefit of the doubt and concluded the stew was made with more than one goose.

But a tundra swan, also called a whistling swan, can have a total body length of over 50 inches, half of which will be neck. A few of the less law-abiding citizens in waterfowl country learned long ago that swans are pretty good to eat.

Bill Hamnett used to work in education for the Wildlife Commission before he became director of the state Natural History Museum and finally retired. As a tireless spokesman for conservation, he would often speak to clubs and school children. Bill said he was up before a class of first-graders in Currituck County, famous as a waterfowl wintering area, right after the Christmas Holidays sometime in the early 1960s.

"How many had swan for Christmas dinner," he asked cheerily. Bill said about half the hands went up over beaming faces.

Clearly swan hunting is not new to North Carolina, but now it's legal.

The large white birds, our biggest waterfowl species, were protected from hunting in the Atlantic Flyway from 1918 until 1984. (A few western states had allowed hunting for years.) A thousand permits were issued the first year. The following season, permits were increased to 6,000, where they have remained. This fall both New Jersey and Virginia will join North Carolina in hunting

At dawn, *a small flock of swans flies over a blind at Lake Mattamuskeet. Swan populations remain high in the Atlantic Flyway because nesting takes place in the far north where droughts do not affect success. The number of swan permits is limited.*

Hunters often hunker *in a pit blind or ditch and set out a mixture of swan and snow goose decoys. To most hunters, a swan is a bonus trophy that can be collected while hunting ducks and geese.*

under similarly controlled conditions.

While some other waterfowl species have declined in the last several years, swan are among those which nest far north out of the much developed and now drought-stricken prairie provinces of Canada and the north-central states where many duck species reproduce. Populations grew over the decades until hunters began to request a season and farmers began to complain about crop depredation. Professional wildlife managers, committed to controlled hunting as a tool of wildlife management, were aware of growing competition for food on refuges between swans and stressed duck populations. They lined up with hunters and farmers to support hunting. The Atlantic Flyway's first swan season in modern times was held in North Carolina in 1984 with little opposition.

Not all of the 1,000 permits issued that first year were used. Exactly 867 hunters killed 334 swans out of an estimated flyway population of 81,100, about half of which wintered in North Carolina. I killed my first one, a gray young-of-year bird, from a field blind near Lake Mattamuskeet.

Last winter about 5,000 hunters killed about 3,000 swans out of an estimated North Carolina population of 50,000.

Hunters may apply for a permit before or during the season that is set by the state within a framework dictated by the federal government. Exact dates vary, but generally it runs from the first of November through January. A drawing is held from permit applications received by October 1. If any are left, they are made available to late applicants.

About half the hunters have been successful in getting their bird, a fact that has had negligible effect on the swan population. For the three-year period before the first hunting season, the flyway population averaged 80,167. During the four-year period when hunting was permitted, it averaged 89,075.

Swans, like goose and most duck species, evolved to eat wild plants. They still take certain submerged vegetation, especially in such refuges as Mattamuskeet. In fact, with their long necks, they compete with puddle ducks like mallards, pintails, teal and widgeon for a limited amount of food. Also like geese and ducks, swans have learned to eat and even prefer row crops like corn, soybeans and the tender emerging shoots of winter wheat and other grains. Consequently, swans can be pests when there are too many.

Hunting is usually in fields, although many are killed from water blinds. Field pit blinds and blinds built in drainage ditches or even looming up in the middle of a field are effective.

Dick Darcey was a veteran waterfowl hunter before he moved to Hatteras Island a few years ago and started hunting swans and geese in a leased wheat field on the Currituck County mainland. He and his partners borrowed a backhoe one afternoon and dug a pit blind which they shored up with boards and timbers. There are boards for benches set low enough that your head is below ground. It makes a concealing and relatively comfortable blind. Take a seat and you are completely out of the weather, a feature guests appreciate on cold January days.

Darcey believes in plenty of decoys. He has plastic nesting shells, silhouettes, full-bodies, big drums painted white and sections of old tires painted white. Most are commer-

cially manufactured snow goose decoys. Together they make a big stool.

"A swan believes there is safety in numbers," he said. "You will do much better with 400 decoys than with 100."

Darcey knows they respond to calls, too. He said he trimmed the reed of an Olt Canada goose call to raise the pitch and simulate the high nasal tone of the tundra swan.

He said, "I have effectively turned flocks of eight to 10 up to a mile away."

Calling has not been necessary the two times I hunted swans. For years I had been watching in awe and amazement as these great white birds would swing close by our blinds, wings whistling in the quiet dawns. Sometimes they would light for a moment outside the decoys while we peered through the myrtle and whispered; then they would pick up and fly off to some less suspicious field.

The first year I could have taken my pick of 50 or more that decoyed one foggy morning near Lake Mattamuskeet. I wanted a young bird for the table and took the first one that came within range. It was about five minutes after legal shooting time. While we hunted geese, swans continued to decoy until we left about noon.

Another year in a soybean field near Creswell we hunkered down in a drainage ditch on a clear, bright day. The birds weren't flying well for a time, but occasionally small flocks would labor up from the south. We waited and, one by one, our group of five ritualistically took his turn downing his swan. When we each had one, we gathered up the birds and decoys and started the long walk to the car.

I felt at that time that swans needed more hunting before they would become as wild as geese, wild enough for me to want to hunt them again. Indeed, Darcey said he noted an increase in swan wariness toward the end of last season.

"It looks like there has finally been enough hunting pressure to begin to make most swans afraid of blinds and hunters," he said.

While that may be true locally, the overall hunting success rate in North Carolina was a little higher last season.

There is a similar situation in regard to greater snow geese. Before the Atlantic flyway season was reopened in 1974 after 40 years of protection, critics said it would be a slaughter. Indeed, geese were easy for a few weeks, but within the same season they began to grow wilder. Managers had tried to set the bag limit and season to effect a certain safe, conservative crop of the expanding Atlantic Flyway population. Despite unsophisticated birds, hunters failed, partly, I would speculate, because there was not a long tradition of snow goose hunting the flyway and therefore few knowledgeable hunters. It was also because snow geese learn fast. The U.S. Fish and Wildlife Service raised the bag limit from two to four and lengthened the season, but silll failed at the end of the following season to reach the cropping goal. Soon snow geese became notoriously difficult to decoy and, with flyway populations at record highs, they remain so today while the total annual kill is down steeply. Snow geese learned to evade hunters. In time, I suspect swans will too.

Swans check out *a spread of decoys. Although the birds were not particularly wary at first, they are learning to avoid blinds and hunters. Snow geese learned this lesson so quickly that cropping goals for the Atlantic Flyway have not been met.*

As with goose hunting, so with swans you are likely to have more success after cold weather sets in around Christmas. Darcey said cold weather kills aquatic vegatation and demands more energy from waterfowl, so they seek the high-energy foods of field crops.

"They are also getting increasingly gun shy by then," he said, "so you will need to have your act together."

In practice, most hunters do no go out only for swans. They are waterfowl hunting or at the very least goose hunting. Consequently shot size choice is a compromise. Many, like Darcey, who hunted snow and Canada geese with lead fours changed to steel twos.

Because swans I shot decoyed so closely, I had no difficulty with a 26-inch, improved cylinder in 12 gauge, shooting magnum 2¾-inch twos. But that was before the steel shot requirement came into effect. With steel shot, sizes F, T and BBs are recommended, but it still may be advisable to pass up shots much beyond 35 yards.

As Core Sounders and Currituck school children learned, swans are good to eat. I made the mistake of overcooking my first one, but the second, another tender, young bird, roasted up beautifully using the same time and temperature I would use for a similarly sized goose—375 degrees for about 1¼ hours in a covered pan.

Many hunters like to take the breast meat off swan, marinate, and cook on a grill with a lid. Darcey said he puts wet wood on the hot coals. Then he cooks about 15 minutes on one side, bastes, turns the meat and cooks for another 15 minutes. He said this achieves medium doneness and a good, smoky flavor. He slices the filet like London broil.

Darcey said he also enjoys a friend's simple recipe: Pour a half jar of honey over the filet and wrap it in a piece of foil. Cook in the oven for 45 minutes at 450 degrees.

"The honey cooks down to a crisp, sweet crust," he said.

Swans are delicious, but many hunters also consider them a trophy bird, one to have mounted to admire for years. With duck and goose populations down in North Carolina, they add a valuable dimension to waterfowl hunting.

THE FISH THAT CAME BACK

Muskie fishing mania is growing as restoration of this big, fierce trophy continues, but it's easy to forget that less than 20 years ago, this fish had all but disappeared from its native waters in western North Carolina.

by Jim Borawa/photography by Ken Taylor

Seemed like nothing was going right for Charles Hensley that April day in 1987 when he caught the state record muskellunge. He had gone to Lake Adger to fish for bass, but he had gotten a late start. By the time he got on the lake, it was after lunch.

Then, after tying on a purple plastic worm—an unlikely lure for a muskie—his trolling motor became hung on some brush just as he made his first cast. The muskie struck the sinking worm, leaving him with the frantic task of getting free of the brush and playing a huge fish at the same time.

Since he was fishing for bass, he wasn't using a wire leader to keep the sharp teeth of a muskie from cutting the line. But fortunately, his streak of bad luck had run out, and after about 20 minutes he managed to land the fish. The worm had hooked the fish on the side of the mouth which kept it away from those teeth. The muskie was 50 inches long, weighed 34 pounds, and set the current state record. Hensley also picked up a $100 prize being offered by a local boat dock operator for catching the record.

***Sunlight filtering into** the water dapples the back of this muskie hooked on a large black bucktail spinner. Muskellunge are native to several large western North Carolina rivers, but virtually disappeared during the early half of the century. Improved pollution controls set the stage for restoration of the muskie in recent years.*

That catch is important in a lot of ways that might not seem obvious at first. Indeed, as recently as 1970 it would have been highly unlikely, if not impossible. The muskellunge, *Esox masquinongy*—also called muskie or musky depending upon where you are from—is native to several of North Carolina's western rivers, but had largely disappeared since the turn of the century. Then, in the early 1970s as pollution entering these rivers began to be reduced by the installation of new waste-treatment plants and the cleanup of industrial effluent, the N.C. Wildlife Resources Commission kicked off a program to reintroduce muskies into the New, Nolichucky and French Broad rivers.

In addition to the pure strain muskie, a hybrid muskie known as the tiger muskie was also stocked into some waters where the pure strain muskie was not native. The goal was to reestablish species that would give anglers a chance at a really big fish. In Minnesota and Wisconsin, both species reach 60 pounds or more. The world record on rod and reel was caught in the St. Lawrence River in New York State in 1957 by Arthur Lawton and weighed 69-pounds, 15-ounces. Even larger muskies have reportedly been caught by commercial methods in years past.

As expected, the sport fishery for muskies developed slowly at first since it takes about five years for the fish to reach the legal size limit of 30 inches. But by 1978, state records began to show a steady increase.

The establishment of a Husky Musky Club provided fisheries biologists with survey information on muskie populations by offering certificates and patches to anglers who reported information and supplied scales from fish caught. Anglers were pleased to be able to help, and their assistance provided scales and information on over 200 muskies ranging from 15 to 50 inches. By looking at the scales under a microscope, the age of the fish can be determined much the same as you'd determine the age of a tree by looking at the growth rings. The oldest fish caught so far is Hensley's current record—a 10-year-old muskie.

***Dedicated muskie fishermen** use large plugs and spinners, but most tackle boxes won't carry these big lures. A small Styrofoam cooler makes a perfect carrier, keeping lures handy and free from tangles.*

During this time, the tiger muskie record increased from a 7-pound, 8-ounce 32 incher caught by Don Francisco in Fontana Reservoir in November 1978 to a 23-pound, 15-ounce, 29-inch fish caught by John Effler in Lake James in October 1983. However, in 1983, the stocking of fingerling tiger muskies was halted because most of the eggs must be obtained from other states. Also, anglers were catching few of the fish. A few of these tiger muskies are still around as evidenced by a 33-pound, 8-ounce fish caught in Lake James in April 1988 by Gary Nanny. As time goes on, however, the tiger muskie will no longer exist in North Carolina.

My involvement with muskies began in 1983 when I took over management of the Wildlife Commission's muskie program. That's also when I began to work with the Western North Carolina Muskie Club, and learned of their interest and willingness to provide the manpower and assistance in projects to help with the restoration of muskellunge. One of the first joint projects with the club was to purchase bird netting to be used around the hatchery ponds to keep egrets and herons from preying on the young muskie. This experiment was carried out for two years, but the survival of fingerling muskie in the ponds was so variable it was difficult to determine how much the netting had helped survival.

Fallen trees, snags *and other cover in big, slower flowing pools are prime habitat. These anglers try their luck on the French Broad River. Catch rates in North Carolina's rivers rival those in traditional northern muskie waters, but that still translates into an average of 100 hours of back-breaking casting for every legal muskie.*

Also in 1983, a habitat study was begun to determine the amount of adult muskie habitat available in the New, Nolichucky, and French Broad rivers. Adult muskie habitat consists of deep, slow-moving pools with sunken logs. Such habitat allows the muskie to hide and ambush other fish. Measuring the amount of adult habitat allowed us to match the number of fingerlings being stocked with each river's capability to produce adult muskie. Knowing how many fish we needed each year also made work easier for the staff at Table Rock Hatchery where the muskies are reared. The French Broad River was found to have the most adult muskie habitat, almost 1,200 acres. The New River followed with 300 acres, while the Nolichucky and its tributaries had almost 200 acres. Fingerlings are now stocked in these rivers every other year at the minimum rate of one fish per acre of habitat. Muskie anglers continue to help us stock these fish. In an effort to spread the fish out as much as possible, the stocking truck has gone into some difficult places. In one instance, the truck got stuck in the mud in the middle of a cattle pasture, and it took two vehicles in tandem to pull it out.

Beginning in 1983, all stocked muskies were marked with a fin clip to distinguish stocked fish from fish reared in the river. Muskie fishermen also help clip fins on stocking days. It looks chaotic at the hatchery with five to 10 people standing around tubs grabbing anesthetized fish and clipping the designated fin, but few problems have been encountered, and the work goes quickly. Actual stocking usually takes another eight to 10 hours of hard work for anglers and Commission employees carrying buckets or nets of fish down the river banks.

Keeping tabs on the elusive muskie is an unending job, and in 1984, biologists from around the nation traveled to the heart of muskie fishing country in LaCrosse, Wisconsin, to attend a symposium and share experiences in managing muskies. Useful information was learned about raising better fingerlings, obtaining better information on our fish stocks, and additional roles anglers can play in helping biologists gather such information.

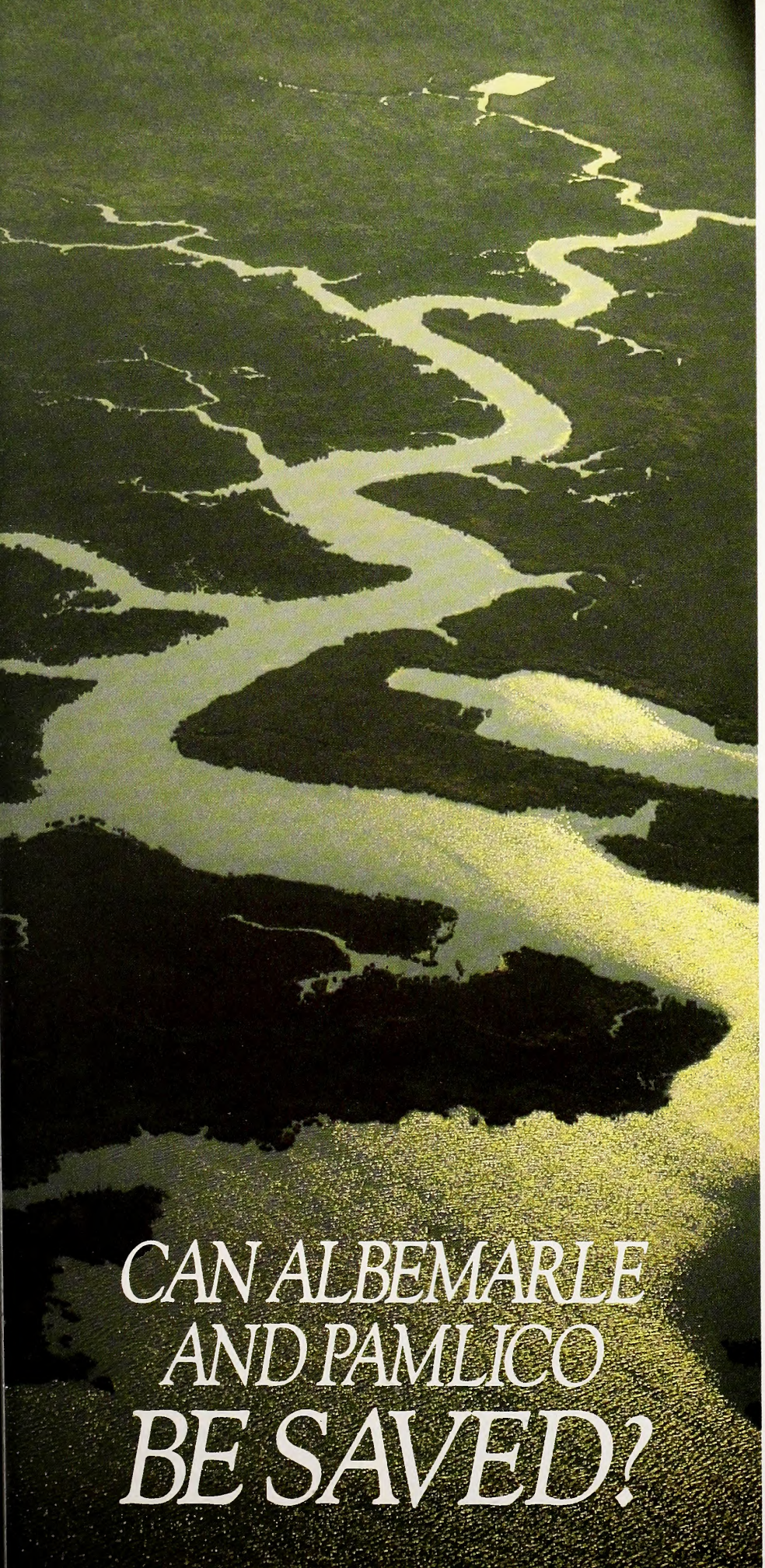
One result of this trip was the initiation of an angler diary program in 1986. Approximately 25 volunteer muskie anglers were recruited to collect data on their fishing trips—especially information on catch rates, harvest rates, whether the fish caught were marked, weather conditions when fish were caught, and the type of lure used. This information is being used to determine the best conditions and techniques for catching muskies in North Carolina's waters, and also this state's muskie catch rates. The national average is one muskie caught for every 100 hours of fishing, but after the first year, our volunteers reported catching muskies at an average rate of one fish every 35 hours. This, however, included muskies of all sizes. When only legal fish are considered it has taken these select anglers about 95 hours to catch one—not far off of the national average!

Not long ago I had the opportunity to try my skills at muskie fishing when the WNC Muskie Club held its annual tournament. I had been particularly interested in fishing with Don Funderud, the club president. And for good reason. Experience has shown that when he takes a guest fishing, the guest catches the fish and he comes home empty-handed. When we gathered at Lake Adger early one morning, I was assigned to another boat, but I borrowed some of Don's plugs.

Although I'm a novice, I worked hard plugging in deep water, shallow water, and around sunken logs, switching between a bucktail spinner and an 8-inch magnum Rapala. By lunchtime my arm and hands were aching, and I was beginning to wonder why muskie fishermen put themselves through such agony. I figured I would be lucky if I just saw a fish that day.

After lunch my enthusiasm was declining when suddenly I thought I felt a resistance in my line. It felt like I had gotten hung up in another log, but this log was moving! After about 10 minutes, I got the fish to the boat but was somewhat disappointed when it measured only 27 inches—not quite legal. I had some consolation, however, because it had a clipped fin and I knew it was a fish that had come from the hatchery.

Maybe next time I can fish in Don's boat. Given his reputation as an expert—and especially as a guide—I feel fairly confident I'll get that keeper. ⊠



CAN ALBEMARLE AND PAMLICO BE SAVED?

KEN TAYLOR

Serious trouble stalks two of the nation's largest estuarine areas, threatening the state's eastern economy and environment. Our best hope for restoration may lie with this five-year study.

by Mark Taylor

On a clear fall day, there isn't a finer place in the world than the top deck of the Cedar Island-Ocracoke ferry. I took my place at the rail, and watched the mainland's golden salt marshes fade into the distance. We passed several trawlers crossing the open waters of Pamlico Sound, and as we approached Ocracoke, two fishermen in a snow-white skiff waved as they checked their crab pots. Nearby, a flock of terns dove for minnows in the shallows.

"Beautiful, isn't it," said a middle-aged woman beside me as she lowered her binoculars. "I've made this trip a hundred times, and never get tired of it. I just hope it lasts."

She wasn't alone. Many people feel that North Carolina's largest estuaries, Pamlico and Albemarle sounds, are living on borowed time. These waters are still incredibly beautiful and productive, second in size and fisheries only to Chesapeake Bay—our nation's most valuable estuary. In the past decade, however, there have been unmistakable warning signs that our estuaries are deteriorating—frequent, massive fish-killing algal blooms, deadly diseases that eat holes through the shells of crabs and bodies of fish, the disappearance of aquatic grasses which sheltered and fed marine life and waterfowl, and a waterfront building boom that has fouled shellfishing waters with organic pollution.

These signs clearly point to a system in trouble. Because of this, North Carolina has launched a major program—the Albemarle-Pamlico Estuarine Study—designed to develop a management plan by 1992 that will clean up our coastal waters. This five-year,

***Pamlico and Albemarle** sounds are among the nation's most productive estuaries, but are also beset by pollution. The Albemarle-Pamlico Estuarine Study — a five-year cooperative effort with the federal Environmental Protection Agency — will produce by 1992 a plan to restore the water quality of the estuaries.*

KEN TAYLOR

Recreational boating, *commercial vessels and marina development contribute organic pollution to our coastal waters, resulting in the closure of waters to shellfishing. The problem is especially acute for oysters. Biologists are mapping oyster beds and studying the feasibility of establishing new beds in cleaner waters.*

$5 million study was established in 1986 as part of the National Estuary Program, a cooperative effort of the federal Environmental Protection Agency and individual states to halt the degradation of our most valuable coastal waters. Other areas targeted for clean-up efforts are Long Island Sound, Buzzard's Bay, Narragansett Bay, San Francisco Bay, and Puget Sound. Funding for the program is provided through the federal Clean Water Act and matching state funds and services.

"The major goal of the Albemarle-Pamlico Estuarine Study is to develop a management plan by 1992 that will enable us to clean up Albemarle and Pamlico sounds, and maintain the estuaries and their natural resources in a healthy state," said Dr. Robert Holman, project director of the study for the N.C. Department of Natural Resources and Community Development. "Implementation of this conservation plan will then take place over the following five to seven years."

The Albemarle-Pamlico Estuarine Study is administered by four committees representing state and federal agencies, universities, conservation organizations, coastal interests, and area citizens. The policy and technical committees set study goals and research priorities, and two citizens advisory committees act as a link to the public.

The work of the study is accomplished mostly through one- or two-year research projects done by universities, conservation organizations and state and federal agencies. Research proposals are screened annually by the study's technical committee, and a priority list is developed for funding. In 1987, the first year funding was available to the study, the technical committee received over 100 project proposals. Seventeen projects were funded, falling roughly into four areas—water quality and estuarine relationships, fisheries, areas and resources critical to the health of the estuaries, and the human use and environment of our estuaries.

This work will help the study reach a major milestone in 1990, when a comprehensive report will be issued on the status and trends in water quality and natural resources in Albemarle and Pamlico sounds. The sources of pollution and

other problems will also be catalogued in this report.

"After this report is issued, the study's focus will shift from basic research to developing and implementing specific management practices that will improve water quality," said Holman. "Another important facet of the study is public education, and our citizens' advisory committees are involved in all phases of the study. We won't be able to solve our water-quality problems without the understanding, support and involvement of the public."

Holman adds that the current research projects focus largely on nutrients, toxic materials, water-quality monitoring, and fisheries.

"Excessive amounts of the nutrients nitrogen and phosphorus cause algal blooms, and are an on-going problem. Project investigators are identifying and mapping the sources and loads of these nutrients, and are also evaluating the role that nutrients buried in bottom sediments may play in stimulating blooms. Other studies are investigating the roles that coastal swamps and agricultural best management practices play in reducing nutrient runoff.

"Researchers are also looking at toxics such as heavy metals and pesticide residues. This is a widespread problem in more heavily industrialized states, and there may be hot spots here. Consequently, we're analyzing bottom sediments and fish tissues for toxic materials. Finally, we're expanding our water-quality monitoring effort to include the tributaries and open waters of the sounds, and are taking a closer look at nutrient loads in these waters."

Holman is also excited about a citizens' program for monitoring water quality. This program is coordinated by the Pamlico-Tar River Foundation and is based on a successful program developed by the Chesapeake Bay Foundation. Volunteers take water samples weekly and test them for temperature, salinity, dissolved oxygen, acidity or pH, and turbidity or suspended solids.

"We've established 16 sampling stations in the Pamlico watershed, and tried to avoid areas that were already being monitored by the state or East Carolina University," said Grace Lekson of Wake Forest, who developed the program with David McNaught, director of the Pamlico-Tar River Foundation. "The factors we test for are basic water quality measures, but we also encourage our volunteers to note anything unusual. In the near future, we'll train additional volunteers from other groups, and expand this monitoring to include Albemarle Sound."

Holman adds that volunteers' observations are as important as their data. "We often don't hear of an algal bloom, fish kill or pollution problem until it's too late. Now, our volunteers can spot these problems early, and be our first line of defense on the water."

KEN TAYLOR

Runoff from shoreline *and urban development (left) contributes many pollutants to our estuaries. Researchers are sampling bottom sediments and fish tissues for toxic materials, and will use this data to identify and clean up contaminated areas in the future.*

A number of fisheries studies are also underway. Researchers are mapping the remaining submerged aquatic plants and grasses, which provide habitat for marine life and waterfowl, and they are also trying to determine why this vegetation disappeared, and whether it can be restored. Another project is surveying existing oyster beds—oysters have declined as salinities dropped—and testing the feasibility of establishing new beds. Still another has tested the effectiveness of excluder devices for shrimp trawls. Excluder devices prevent sea turtles from drowning in nets, and also reduce the accidental catch and wastage of young flounder, spot, trout and other fish. Other investigations are continuing into the causes of fish and crab diseases.

One of the study's fisheries projects has already met with success. Recent work by

Farmland (below) is *a major source of nutrient pollution, but conservation practices by farmers can control this pollution. These practices have already reduced nutrient runoff into the headwaters of Merchant's Millpond State Park in Gates County.*

KEN TAYLOR

DIVISION OF MARINE FISHERIES

Commercial fishermen sort *crabs at a packing house. Diseases that affect fish and crabs threaten the livelihoods of many fishermen, and have been linked to many of the pollution problems in Albemarle and Pamlico sounds.*

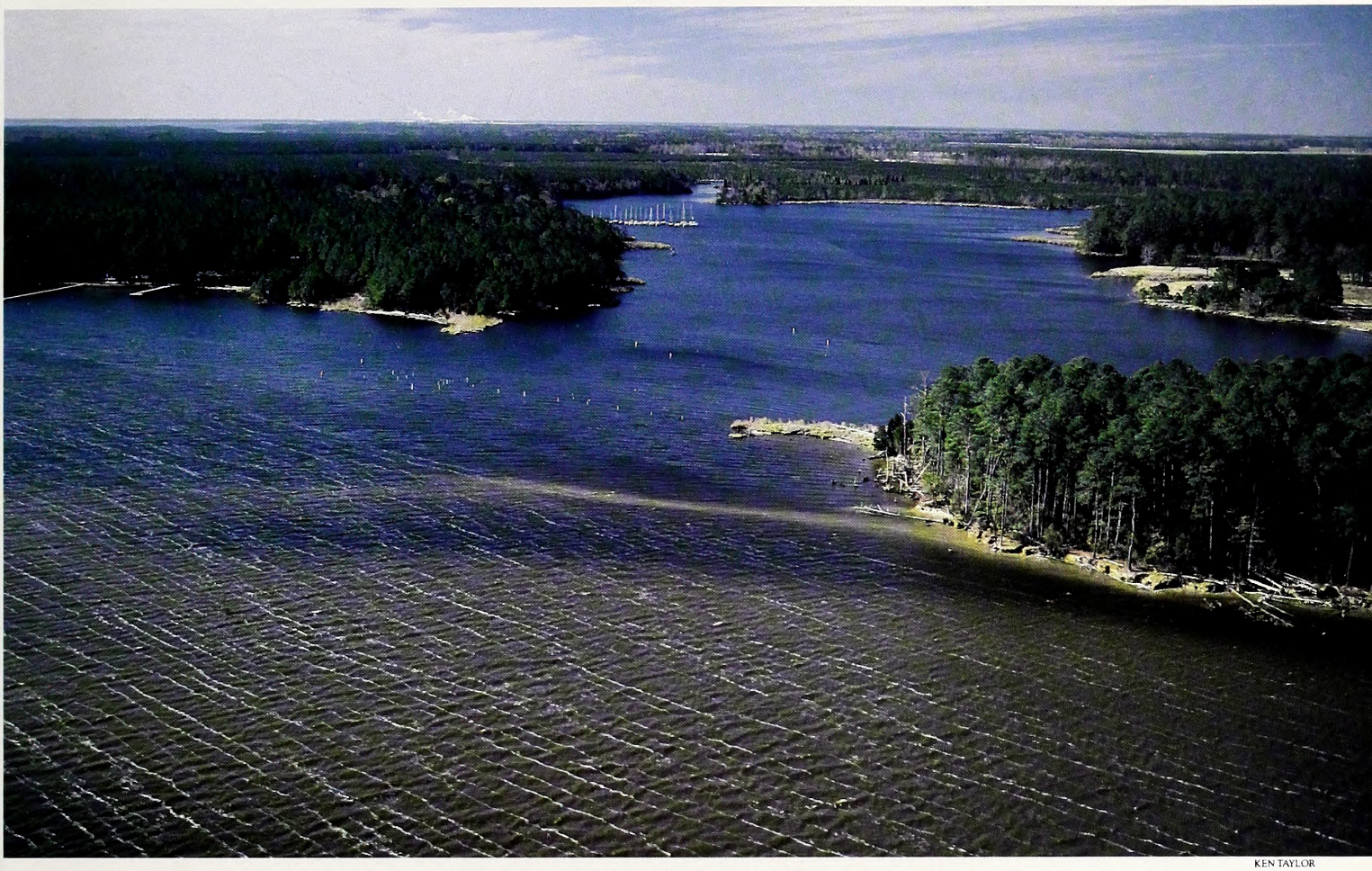
Dr. Roger Rulifson at East Carolina University indicates that the decline of the striped bass in Albemarle Sound may be caused by fluctuating flows in the Roanoke River, which serves as their spawning ground. The river's flow is controlled by several dams. If flows are too low during the spawning season, there may not be enough water to carry the developing eggs to the food-rich, protected waters of the upper sound. If too much water is released, the eggs may be flushed out into open water where food is scarce and predation high. Experimental releases that simulated natural flows last spring produced the best crop of young stripers since 1976.

"The decline of the striped bass is probably the number one concern around Albemarle Sound," said Dr. Parker Chesson of the College of the Albemarle in Elizabeth City, and chairman of the Albemarle Sound Citizens Advisory Committee. "However, it's just one of the visible signs that something's wrong with our estuaries."

The Albemarle-Pamlico Estuarine Study has also earmarked funds to correct immediate problems. This year, cost sharing for agricultural best management practices is being provided to farmers in Gates County to reduce nutrient runoff into Merchant's Millpond State Park, which is suffering from excessive algal blooms and aquatic weeds. In Hyde County, a water-control device is being installed on a drainage ditch that leads directly into a primary nursery area for young shellfish and other marine life. The device will protect aquatic life from sudden influxes of fresh water, and will also allow fresh water to be slowly released where it will be quickly and harmlessly dissipated in the sound.

These two projects are typical of the measures that will be needed to protect our sounds in the future. Estuaries are a mix of both fresh and salt water, but too much fresh water can cause problems. The loss of aquatic vegetation, shellfish nursery areas and oyster beds are all linked to declining salinities caused by excessive freshwater runoff. The nutrients carried in this runoff also fuel algal blooms, and contribute to fish and crab diseases.

As the human populations of North Carolina and Virginia have expanded, however, land clearing in both urban and rural areas has caused more freshwater—



KEN TAYLOR

Coastal wetlands and *forests play an important role in protecting coastal water quality. These areas absorb water like sponges, preserving salinities in adjacent waters and filtering nutrients and pollutants. Study investigators are surveying coastal natural areas, and developing strategies for their protection.*

loaded with nutrients, agricultural chemicals, heavy metals and oil residues, and other nonpoint pollution—to rush into the sounds with every heavy rain. The problem has been compounded by the ditching and draining of coastal swamplands.

"Much of the success of the Albemarle-Pamlico Estuarine Study will ultimately depend on controlling freshwater runoff with better land management,"said Dr. B.J. Copeland, a member of the study's technical committee, and also director of the North Carolina Sea Grant program. "One of the study's current projects, for example, is an inventory of the wetlands, forests and other natural areas surrounding the sounds. We need to preserve these areas because they hold water like a sponge, filtering out nutrients and other harmful substances as the water slowly seeps through the soil. We'll also need wider use of greenbelts, buffer strips, stormwater runoff controls, and agricultural best-management practices. All of these practices are similar whether they're used in cities, on farms, or in coastal developments. A strip of undisturbed land is left bordering the water so that unfiltered runoff will not have a chance to reach our rivers and sounds.

"Other changes will also be needed. Coastal drainage ditches should be routed away from shellfish nursery areas into more open waters, and equipped with devices that control their flows. Sewage-treatment plants should be upgraded, and many coastal communities have already made improvements by switching to the land application of sewage. The treated sludge is spread on forests and fields, where the nutrients enter the soil instead of the water."

The technology certainly exists to clean up our coastal waters; however, the ultimate success of the Albemarle-Pamlico Estuarine Study is dependent upon public involvement and support. We will have to change the way we build our cities, farm our land, develop our coast, fish our waters, and even alter some of our personal habits and lifestyles if we are to have healthy and productive estuaries.

"We're fortunate that our estuaries are still relatively clean compared to others—such as Chesapeake Bay or Long Island Sound," said Holman. "In another four years this study will give us the tools we need to clean up our waters, but then it's up to the public to see that the work gets done. I'm optimistic, however, because I think the outcry we heard last summer about the closed beaches in New York and New Jersey shows that the public cares about clean water, and wants to quit using our coastal waters as dumping grounds."

Holman is not the only member of the study who feels we are at a crossroads. Captain Al Howard of Arrowhead Shores near Edenton is a member of the Albemarle Sound Citizens' Advisory Committee, and has been involved in the cleanup of the Chowan River since he retired there from the Navy in 1975.

"We can clean up our estuaries if we really want to," he said, "but I think we've abused our waters so badly that this is our last chance. We're putting together a good plan, but only the public can see that its measures are put in place and then rigidly enforced. If we don't act soon, I see a sad day coming. That's when you'll be able to stand on the Oregon Inlet bridge, look to the east, and see nothing but the blue waters of the Atlantic. Look to the west, though, and all you'll see are green, algae-covered sounds."

SQUEEZING *the* BLACK BEAR

The black bear once roamed enormous areas of desolate mountain terrain, but that habitat has dwindled and there are disruptions even in protected areas.

written and photographed by Lawrence S. Earley

"The hussy!"

John Collins was angry.

Scrambling through a snow-covered laurel slick near the Harmon Den Bear Sanctuary in Haywood County, he was pulling on rhododendron branches to keep his balance and his Irish face was reddening against the cold. The changeling March day had begun pleasantly, but then it had turned raw and even now it was snowing at a ground-covering pace.

"The brazen hussy!" John exclaimed again. "Did you see her?"

We pointed downslope. The bear had surprised Dil, Gary, Pete and me about 10 minutes before, suddenly materializing on the slope below and ambling slantwise down the mountain through a thicket of laurel and rhododendron. She was moving heavily, as if shaking off the effects of a long winter's nap. As it turned out she was also trying to shake off the contents of a hypo loaded with tranquilizer.

"A denning bear's not like a groundhog," John had said not long before. "He's aware of things. He's just groggy, kinda half here and half gone. You can spook a denning bear."

Which is sort of what happened.

John and Steve Siebert had left the rest of us on the slope while they climbed to the bear's den. John, the coordinator of the N.C. Wildlife Resources Commission's big-game program, and Steve, a graduate student at the University of Tennessee doing black bear research in the Pisgah Mountains, would tranquilize the bear and then the rest of the

***Fuzzy month-old** black bear cub snuggles up to biologist John Collins as it awaits ear tag in Pisgah National Forest. Biologists learn about bears by outfitting them with radio collars and tracking their movements electronically with a portable telemetry unit as shown in photograph above.*

group would join them at the den site. The bear would be weighed and the cubs, if there were any, would be tagged and weighed and measured. That was the plan. But after Steve had jabbed her with the hypodermic she had suddenly awakened and bolted past them like a furry bowling ball. Left behind were four tiny cubs.

It was the second bear that had spooked that day. The first one heard them coming and didn't wait around for the needle. So John was angry. "That bear should've stayed down!" he complained.

In the 20 years he's been studying bears and managing bear populations in North Carolina, John has learned to put up with the occasional bear that won't stay down. Someone who handles large specimens of *Ursus americanus* with regularity has learned a thing or two about human limitations. Perhaps that's the secret behind John's sense of humor, which is as much a Wildlife Commission legend as is his knowledge of bears.

Take, for example, the case of the phantom bear. Not long ago a bear wandered onto the campus of North Carolina State in Raleigh. As the Commission's black bear expert, John was called to Raleigh from Morganton, his home, and dutifully followed television crews and campus officials who gathered around a track in the mud. As cameras rolled and a vast TV audience anticipated the expert opinion, John examined the track carefully. "Waal," he said, in his strong and resonant voice, "it sure looks like a bear track to me." "How much does it weigh?" asked an aggressive television reporter. "I don't rightly know," John replied. "I never weighed a bear track before."

About an ancient slide projector he once owned: "Son, that was an old timer; it come over on the Mayflower."

About trying to trap bears with only two people: "That's slower than winter molasses."

He loses his sense of humor, however, when the discussion turns to the way humans are squeezing the black bear into smaller and smaller pieces of the landscape. He shakes his head. He groans audibly. He lets fly with an expletive or two. These are not good thoughts.

Of course, one could argue that things are better for the black bear than they've been in some time. Indeed, by the 1960s the bear was in serious trouble throughout its range. Rapacious logging by large private timber companies at the turn of the century had destroyed immense areas of bear habitat in the mountains, and unrestricted hunting and trapping had severely reduced the bear populations. There were natural catastrophes, too, chief of which was the demise of the chestnut tree whose nuts benefitted many wildlife species including the bear. More recently the construction of mountain resorts and second homes during the 1960s had made further inroads into the bear population.

By the late 1960s, low bear populations prompted the Wildlife Commission to reduce the bag limits and length of the hunting season to help reverse the downward trend. The Commission also established 28 bear sanctuaries statewide where hunting was prohibited (25 sanctuaries exist today).

Still, black bears have been forced to accept a smaller slice of the habitat pie, especially in the east where large, remote areas that bear prefer are in short supply. And poaching has allegedly become a major problem in the North Carolina mountains, where an illegal commerce in bear parts has

Biologist disappears headfirst *into a bear den to fetch cubs born to a black bear last winter. Bears den in trees, beneath rocks and sometimes curl up with little protection at all. This bear denned beneath a toppled tree in a logged tract.*

made serious inroads on the bear population. Today the black bear is found in 24 western counties and 28 eastern counties, and an occasional transient bear will wander a Piedmont stream course, galumphing into an urban neighborhood to forage garbage and scare housewives out of their wits. In the mountains, 11 bear sanctuaries combine with the Great Smoky Mountains National Park to give bears a refuge from hunters and a place where they can breed without harassment.

The Commission also provides material assistance and personnel for black bear research. Currently, it is aiding two projects, one out of North Carolina State University, under the direction of Dr. Roger Powell, and the other a U.S. Forest Service-sponsored bear study by the University of Tennessee, headed by Dr. Michael Pelton. This was the project that John was monitoring this cold March day.

The biologists were working fast now. The mother's instinct would eventually carry her back to her cubs, but she wouldn't return as long as humans were there. Black bears in the North Carolina mountains generally tend to den during the first two weeks of December and they'll stay there until March. Denning females stay put a lot longer than males and choose more secure den sites. It's not unusual to find a bear 80 feet high inside a tulip poplar tree. On the other hand, den sites can be quite casual. "A lot of times they'll just den on top of the ground, or in a thicket," John said as we worked our way to the den. "They'll just ball up and lie right there for three months."

This bear had climbed to a steep slope that tumbled to a narrow valley. Across the valley sentinel white pines kept a green watch over the leafless hardwoods. The bear's den was merely a small hollow beneath a fallen tree, nothing very elaborate. She had wormed her way through the branches, curled up and gone to sleep. About a month before, she had given birth to her four cubs.

When we got to the den, Steve was flat on his belly, head in the den, distributing bear cubs. "Here, take one," he said, handing John a little ball of fur. John stuffed the puppy-sized cub beneath his parka and zipped it up. After squalling once or twice it crawled around until it found a warm spot and went

***Graduate student Steve Siebert** prepares jab stick to tranquilize a denning female bear. The harmless tranquilizer deepens the bear's natural sleep, enabling researchers to weigh and measure the bear and record biological data about her cubs.*

to sleep. It made snoring sounds like little squeaks. The group of biologists was looking like a convention of pregnant men. All were sporting big bellies. One of the cubs stuck its head over a parka zipper and gazed around curiously.

Meanwhile, Steve was recording basic biological data about each cub. He measured each bear's paws (length and width) and the crowns of its head. Then he weighed the cub by slipping it into a knotted red handkerchief and suspending the package from a portable scales that he removed from his backpack. The little bears looked around wide-eyed as they swung in the cold. Most of them weighed about four pounds. The one touchy moment occurred each time a cub's ear was perforated with a yellow, plastic tag. One or two of the cubs wailed like newborns and I was sure that the sound would bring the mother back on the double.

For two weeks each summer, Collins and other Commission personnel have helped Pelton, his students and Forest Service personnel trap bears and attach radio collars to them. The collars send out a signal that can be tracked by portable telemetry units. Such long-term electronic study reveals valuable information about bears—habitat utilization, time of denning, time of emergence, reproduction, growth rates. In the seven years of the study, 54 bears have been trapped, 48 have had radio collars attached, and 11 cubs have been tagged.

This research project, now in its seventh year, is funded by the U.S. Forest Service to measure the effects of its logging activities and road building on the bears in the Harmon Den area. Throughout the Southern Appalachians and especially in western North Carolina, the majority of remaining bear habitat exists on national forests. Though the conclusions of his study are only preliminary, Pelton has found that road construction and highly traveled roads in his study area are having an effect on the bears. That would include any road during construction, or any road left open and traveled regularly after construction. Studies indicate, however, that once roads are gated or closed, the bears can return and use an area. Of course, highways like I-40 hardly fit into that category. Pelton's conclusions will get no argument from the Forest Service or John Collins.

"Access is the demise of bear habitat," Collins said, "and anybody with common sense will tell you that. The bear in the Piedmont has been wiped out and been replaced with people. For every mile of road you punch into these mountains and leave open you're just putting another nail in the bear's coffin. That's the way I see it."

Even at three o'clock the afternoon was growing darker. The snow continued to fall and John's face looked even ruddier now. It was time to return the bears to the den and hope for the best. A couple of the biologists donated their sweaters for the cubs. Steve carefully wrapped the little bears up in the sweaters while the rest of us stripped a small hemlock of its fragile branches and gathered some white pine boughs for the cubs' bed. Steve launched himself headfirst into the den once more and arranged the branches to insulate the cubs from the cold. Finally he placed the small package of cubs onto the bed. The cubs would lie in a fragrant bower of white pine and hemlock until their mother showed up.

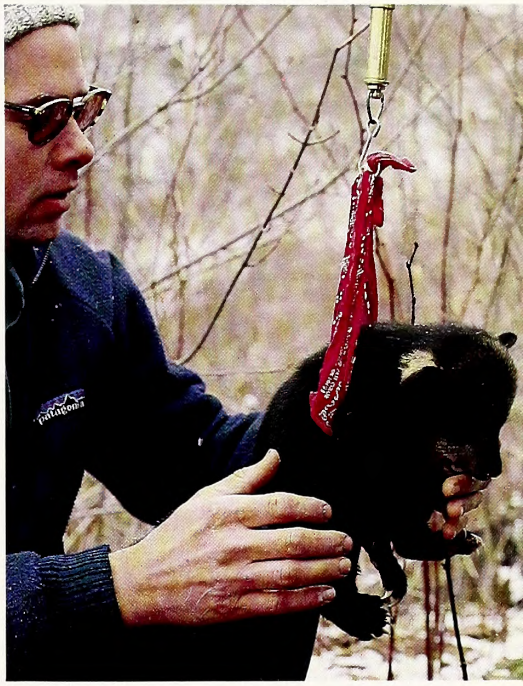
Steve was confident she would return. "She's seven years old," he said, as he emerged from the den, "and she's an experienced mother. She'll come back."

We left the mountain then, trekking down the slope and through the laurel and rhododenron. We passed a couple of hikers in a lean-to not far from the Appalachian Trail. They had already turned in for the day, perhaps defeated by the surprisingly bitter cold. One stuck his head over the top of his sleeping bag and gazed at us as we walked by.

We followed the logging road out to I-40 and began the hour's drive back to Waynesville. We were glad to get out of the cold. "You can imagine this country before I-40 went through," John said. "You can drive that road right through the Pigeon River Gorge and on into Tennessee. That was all prime bear country once and, son, you had to be a tough nut to operate in this country then. Before that highway was built, there was no way to get into this country except by old wagon trails. Now there's plenty of access.

"If it sounds like I'm pessimistic about the black bear, you're right," he said. "The bear is a highly adaptable species, or else it wouldn't have made it into the 20th century. But as time goes on, the bear will be pushed out by man. All species that rely on wilderness are going in the same direction. It's only a matter of time." ⊠

Author's Note: Mother and cubs were reunited the next day and are today fattening up for the winter in their Pisgah Mountain refuge.



***Baby bear swings** below a portable scales, giving biologists data concerning its health. An average of 2½ cubs every two years is common for black bears, with family numbers dropping when food is scarce. A good acorn crop in the mountains two summers ago enabled this cub's mother to give birth to four young.*

***Month-old bear** cub has its paws measured by a researcher. Mating takes place in July and females usually give birth to their cubs in late January or early February. In the mountains, bears den by the middle of December and though not true hibernators, remain in a deep sleep or torpor until March.*

Narrows Search For Big Bucks

Trophy Whitetail Deer Scoring Helps Bowhunters

Written and Edited by Mark Taylor

Ever wonder how your deer stacks up against others? If you're a bowhunter, you can get the answer from the N.C. Bowhunters Association.

"We keep records not only for deer, but all big game and many smaller game species taken with a bow and arrow," said Ramon Bell of Stokesdale, records chairman of the association. "Most entries are for whitetail bucks, but we also keep records for whitetail does, black bear, wild turkey, wild boar, raccoon, bobcat, red and gray fox, groundhog and other animals."

Entries are scored using the Pope and Young system. Scoring is based on antler measurements for buck deer, and skull measurements for does, bear and smaller animals. Hunters must also sign an affidavit of fair chase, which ascertains that the game was taken ethically and legally.

"The Pope and Young scoring system is for bow hunting only," said Bell, "although it's very similar to the Boone and Crockett scoring, which is used for both bow and gun hunting. The minimum scores for listing trophy deer with the N.C. Bowhunters Association are lower than the national minimums kept by Pope and Young because our deer taken by bow are generally smaller.

"The affidavit of fair chase assures that the game was taken fairly. For example, hunters cannot take animals in snow or within enclosed areas or with the aid of vehicles or electronic devices such as walkie-talkies. Of course, all wildlife laws must also be followed. We rely on the honor system, and enforce it as best we can. Occasionally, we find violations of fair chase. These records are dropped from the books, and the hunter is permanently barred from submitting any other trophies to the N.C. Bowhunters Association."

Many sportsmen ask why hunting records are listed by antler or skull size instead of by weight — as is the case with fishing records.

"There are several reasons," said Bell. "First, it's hard to find a set of certified scales large enough to weigh a deer or bear. Also, these animals need to be field-dressed quickly or the meat will spoil. Over the years, organizations have found that maintaining official hunting records by live or field-dressed weights is unworkable.

"The largest deer do not always have the biggest racks, perhaps as a result of the soil type or genetics of a particular deer herd," he said. "So, if a hunter is interested in hunting trophy deer, he can examine the records and concentrate on an area that produces these deer. It's also not much different from watching baseball scores — I got involved in scoring because I've always been interested in statistics. A final benefit of keeping these records is that it gives recognition to the hunters and the animals."

The N.C. Bowhunters Association maintains a statewide network of scorers. Hunters who are interested in scoring their game may contact Ramon Bell, N.C. Bowhunters Association, 7796 NC 68, Stokesdale, N.C. 27357.

RAMON BELL

A Day To Remember: *J. Hickman of Mebane was hunting in Orange County last October when he took the new bowhunting state record whitetail. The Pope and Young score for the deer was 161 points.*

Bear Gall Bladders A Hot Item

Operation Smoky Nets Mountain Bear Poachers

State and federal wildlife officials recently wrapped up one of their biggest operations ever in North Carolina.

Operation Smoky netted 43 people from three states involved in a massive black bear poaching and marketing ring.

Officers with the N.C. Wildlife Resources Commission, U.S. Marshals Office, and agents of the U.S. Fish and Wildlife Service spent three years working on the undercover operation, which centered on the Great Smoky Mountains National Park. Agents posing as buyers purchased 266 bear gall bladders, 385 bear claws, 77 bear feet, four bear heads, nine bear hides and one live bear cub. They also bought two mounted ducks, one mounted hawk, three stolen vehicles, and a gallon of moonshine.

Black bear parts, especially the gall bladders and feet, are sold illegally in Oriental markets where they are used in rituals or believed to have special qualities. The claws are sold for making jewelry, and the hides and heads as trophies.

The arrests began early on the morning of Aug. 22, when agents split into 28 raid teams and headed for suspect's homes throughout the North Carolina and Tennessee mountains. Most of the arrests were made in North Carolina, although one person was arrested in Georgia.

Black bear populations in Tennessee, North Carolina and Georgia are considered a fragile resource by wildlife biologists. A tri-state bear study identified illegal killing as one of the major problems facing the black bear, and biologists suspect this poaching is having a major impact on mountain bear populations in North Carolina.

Much of this poaching is linked to the commercialization of bear parts, and this undercover operation was designed to halt this commercialization. Law enforcement officials say that uniformed officers alone can't stop this type of poaching.

The suspects were cited under the Lacey Act, which prohibits the interstate transport of illegally taken game, and the Migratory Bird Treaty Act. They also face charges of conspiracy and violating National Park Service regulations and state wildlife laws.

— *Angela Hill*

Need Public's Help

Biologists Hope To Save Longleaf Pine Forests

The Natural Heritage Program is looking for a few good forests — longleaf pine forests, to be exact.

The goal of the Natural Heritage Program, which is part of the N.C. Division of State Parks, is to identify and preserve unique ecosystems through cooperative agreements with landowners. The program recently received grants from the state's newly created Natural Heritage Trust Fund to study the endangered longleaf ecosystem. Biologists have found 62 rare or endangered lants and animals in North Carolina longleaf forests, and hope to locate and conduct biological surveys on the state's remaining longleaf pine forests.

"In addition to the longleaf pine survey, we're also seeking information on mountain bogs, fens and swamps," said Charles Roe, coordinator of the Natural Heritage Program. "Most people don't associate wetlands with our mountains, but a few of these areas remain. These small wetlands are very interesting and harbor over 80 rare or endangered plants and animals."

Anyone having information on the locations, conditions and ownerships of longleaf pine forests and mountain wetlands is asked to contact the Natural Heritage Program, N.C. Division of State Parks, 512 N. Salisbury St., Raleigh, N.C. 27611.

Field Notes

Season openings, closings, and regulation changes:

Eastern gun deer season	Open through Jan. 2
Central bow and arrow deer season	Closes Nov. 5
Central muzzleloading deer season	Nov. 7-12
Central gun deer season	Nov. 14-Jan. 2
Northwestern bow and arrow deer season	Closes Nov. 12
Northwestern muzzleloading deer season	Nov. 14-19
Northwestern gun deer season	Nov. 21-Dec. 3
Western bow and arrow deer season (see regulations for Yancey County exception)	Closes Nov. 19
Western gun deer season	Nov. 21-Dec. 10
Western bear season	Oct. 17-Nov. 19 Dec. 12-Jan. 2
Wild boar	Oct. 17-Nov. 19 Dec. 12-Jan. 2
Gray and red squirrel	Open through Jan. 31
Fox squirrel (in open counties)	Open through Dec. 31
Rabbit	Nov. 19-Feb. 28
Quail	Nov. 19-Feb. 28
Grouse	Open through Feb. 28
Western raccoon and opossum season	Open through Jan. 31
Eastern raccoon and opossum season	Open through Feb. 28
Rails, moorhens and gallinules	Closes Nov. 11
Woodcock	Nov. 19-Jan. 2
Common snipe	Nov. 14-Feb. 28
Mourning doves	Nov. 23-26 (all day) Dec. 19-Jan. 7 (all day)
Ducks, mergansers and coots	Nov. 24-26 Dec. 15-Jan. 7
Sea ducks	Open through Jan. 14
Snow and blue geese	Nov. 3-Jan. 31
Brant	Nov. 24-26 Dec. 15-Jan. 7
Swan (by permit only)	Nov. 3-Jan. 31

Major Regulation Change — Legal shooting hours for waterfowl run from legal sunrise through sunset. In past seasons, legal shooting hours ran from one-half hour before sunrise to sun set. However, webless migratory game birds, (rails, moorhens, gallinules, woodcock, snipe and doves), may still be hunted from one-half hour before sunrise until sunset.

Check the *Regulations Digest* for information on season boundaries, bag limits, and other regulations. Copies of waterfowl regulations are also available from license agents.

The 1989 North Carolina Wildlife Calendars Are Here!

***With such artwork** as Bob Henley's "Bluebirds" featured above, the N.C. Wildlife Calendar is sure to be a success!*

The work of Larry Barton, Duane Raver, Robert B. Dance, Alan Cheek, Bob Timberlake, Bob Herr, Bob Henley, James A. Brooks, Ronald J. Louque, Louis Frisino and Judy Johnson McPherson are featured in the 1989 Wildlife Calender.

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For fund raising and bulk rate information (10 calendars or more), call 919-733-7380. Please allow 4-6 weeks for delivery.

CALO 89

Birds Plentiful At Coast

Sea Ducks Offer Hunting Alternative

Bad news about puddle and diving duck populations got you down? Then, try hunting sea ducks.

Three sea ducks — old squaw, eiders, and scoters — are found in North Carolina waters, but by far the most common are scoters.

"Sea ducks nest along the coast of the maritime provinces of Canada and in the Arctic tundra," said Grady Barnes, section manager for the Commission's Division of Wildlife Management. "Consequently, they've escaped the drought that has dried up many of the prairie potholes where most of our ducks breed. Sea duck populations are stable, and North Carolina waters offer good hunting."

Hunting sea ducks isn't especially difficult, but you need a good boat. The birds may be hunted in the ocean, where they often fly offshore parallel to the beach, or in the sounds. Simply anchor your boat, and cover it with camouflage netting to break up its outline. Then, set out some decoys. A diving duck decoy may be converted to a scoter decoy by painting it black, and some hunters simply spray plastic milk jugs or bleach bottles black and use them as decoys.

"The trick is to find where the birds are flying," said Barnes. "In the sounds, the birds fly back and forth between their feeding grounds and the areas where they raft up in open water. Hunters should find and hunt these flight paths. Watch the weather, though, because the water can quickly get rough. A seaworthy boat is a must, and hunters should wear personal flotation devices and head for shore immediately if the weather changes.

"Sea ducks are also occasionally taken from shore. The best hunting is found on the ends of long points."

The sea duck season opened on October 1 and runs through January 14 (except during the regular duck season when they may be taken anywhere, sea ducks may only be taken in the Atlantic Ocean and in the coastal waters south of U.S. 64 that are separated by a distance of at least 800 yards of open water from any shore, island or marsh). The bag limit for sea ducks is seven per day, and may be taken in addition to the bag limit for regular ducks.

Urges Better Sportsmanship

Reader Favors Mackerel Limit

Dear Wildlife:

I believe that putting a limit of 10 fish per person on Spanish mackerel could be a blessing in disguise. Years ago, my friends and I would hire a charter boat to fish for a variety of gamefish — everything from Spanish mackerel to tuna. We'd troll, and when we got a strike the captain would put the boat's engines into idle and let the fisherman reel in the fish — or maybe not, if the fish got off.

Today, most fish are reeled to the boat without the engines being idled, and the fish is often pretty well drowned. I wish everyone would go back to the basics, and give the fish a fighting chance. Let's fish for the sport of it, and with the new limit I do believe that sport fishing can come back again.

— *Nicholas F. Serge*
Morehead City

Worth Millions

Clean Rivers Mean Jobs

It's hard to put a price on the value of the outdoors, but the enjoyment of our rivers is worth millions. The Tennessee Valley Authority, for example, has monitored recreational use of the Ocoee River in North Carolina and Tennessee and found it forms a major industry.

In 1987, outfitters took over 91,000 paying customers down the whitewater stretch of the Ocoee. At an average of $30 per customer, the river generated $930,000. Recreational use of the Ocoee had increased 12 percent over the previous year, and 26 percent since 1985.

No Stings From Encounter

Room With View

HENRY R HYNE

A Unique Perspective: *Henry Rhyne of Mount Holly recently photographed the inside of this small hornet's nest. The nest was built against a window, and in the top third of the nest you can see the "grubs" being attended by the workers as the fighters stand guard around the outside.*

Rhyne enjoyed using a light to watch the inner workings of the nest, and was able to photograph it using a flash. "This is the first time I've ever been inside a hornet's nest," he noted, "although much of my life has seemed that way."

Calendar Of Events

Nov. 3-5
Cape Hatteras Anglers Club Annual Invitational Surf Fishing Tournament. For more information contact the Cape Hatteras Anglers Club, P.O. Box 145, Buxton, N.C. 27920.

Nov. 5-6
17th Annual Folk Festival USA at the High School Auditorium in Louisburg. Features folk music, dance and other entertainment.

Nov. 18-21
Annual World Championship Red Drum Fishing Tournament along the Outer Banks. For more information contact the N.C. Coastal Federation, Rt. 5, Box 603, Newport, N.C. 28570.

Nov. 20
Harvest Day at the Schiele Museum of Natural History in Gastonia. Celebrate an 18th century farm harvest.

Bottomland Print Offered

Proceeds from the sale of these prints will be placed in the Nongame and Endangered Wildlife Fund which supports a variety of nongame wildlife projects and the purchase of wildlife habitat in North Carolina. Each poster-sized, numbered print bears the North Carolina State seal, Governor Martin's signature, and the artist's signature.

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The Wildlife Endowment Fund Report

The Wildlife Endowment Fund is supported by the sale of lifetime licenses, lifetime subscriptions to *Wildlife in North Carolina*, and tax-deductible contributions. Only the annual interest from this fund is used for wildlife conservation, and the fund will play a key role in supporting wildlife programs in the future. Interest is earned through investments made by the State Treasurer's Office. For more information, write to the Wildlife Endowment Fund, N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27611.

Status on August 31, 1988

	Numbers Sold	Revenue Received
Lifetime Sportsman's License	45,182	$14,959,961.80
Lifetime Hunting License	359	89,598.31
Lifetime Fishing License	3,471	683,099.77
Lifetime Subscriptions to Wildlife in N.C.	1,416	183,988.87
Contributions	—	115,509.31
Fund Total		$16,032,158.06
Total Interest Earned	$3,262,721.17	

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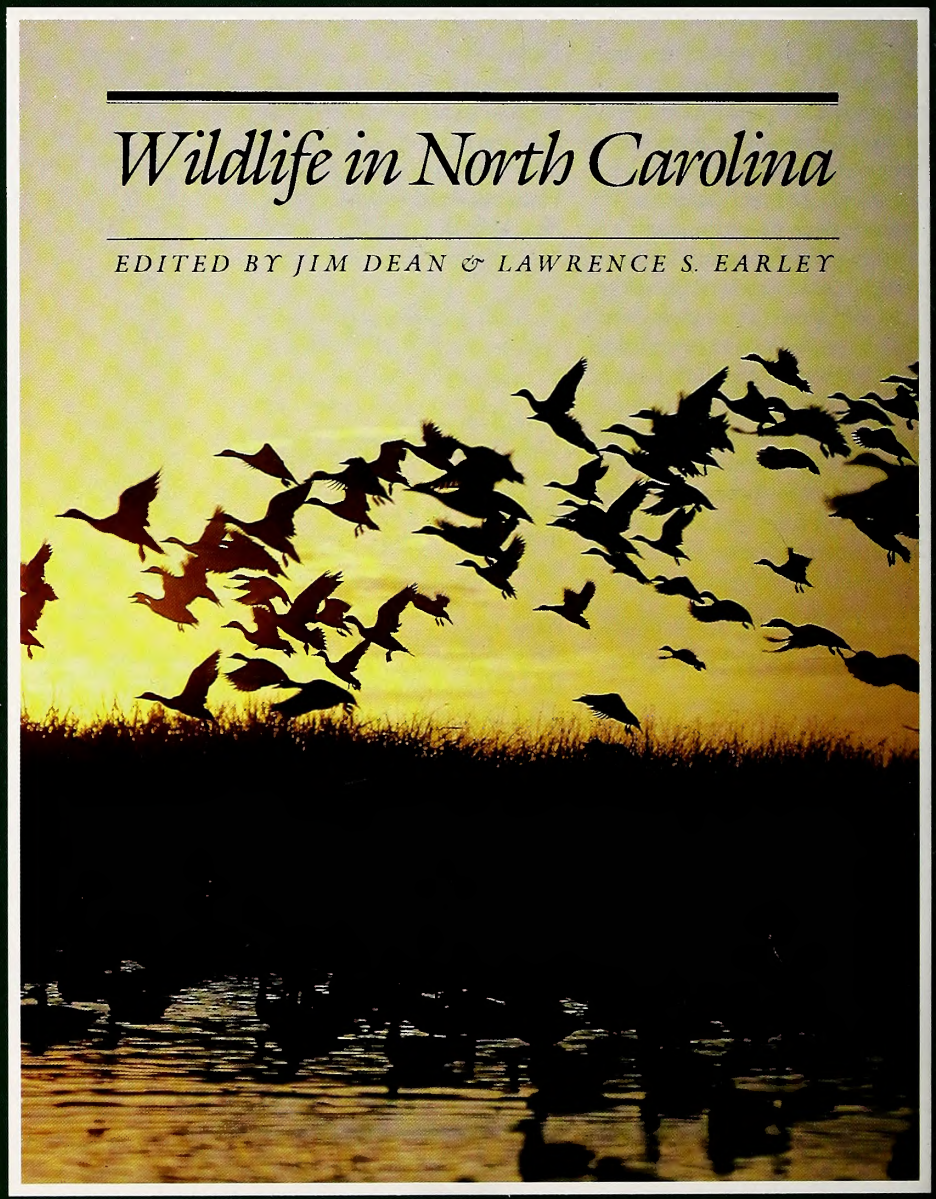

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Woodies On The Wing

Male and female wood ducks darting through the branches of an oak look real, but look again. This pair of "wood" ducks was carved by Ben A. Heinemann of Durham.

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WILDLIFE IN NORTH CAROLINA

DECEMBER, 1988 75 CENTS

A Different Kind Of New Year's

by Jim Dean

Gusts of cold rain battered the truck for the first three hours before the windshield wipers began to pile up ridges of sleet. A few miles farther it seemed as though I had passed through the sound barrier into utter silence. The gusts and rattling sleet were replaced by a soft, fine snow falling out of a luminous, gray sky. The sky seemed very close and intimate like an old flannel blanket you could pull around your neck. As the snow began to cover the road, I pulled off and locked in the hubs on the front wheels.

JIM DEAN

It was so absolutely quiet that I could hear the tick of tiny flakes on top of the truck and on the split rails of a fence that bordered the road. I stood for a moment and watched the rolling fields and distant foothills fade—a painting being scrubbed to white canvas. At that moment I knew I had made the right decision. New Year's alone.

It had been one of those last-minute notions. Facing a traditional celebration with tipsy crowds followed by football on TV and snoozing between snacks, I decided I'd rather plant one foot into the last century for a few days. As soon as that was settled, I knew exactly where to do it.

I passed fewer and fewer cars as the road became more treacherous, and by the time I turned off on the last 15-mile stretch of single lane logging road, I was leaving the only tracks. I punched in a tape of Christmas carols, and poured a cup of coffee. An almost delirious happiness took hold, and I was adding a superb bluegrass tenor—my judgment, of course—to "The First Noel" as I plowed through the last drifts to the cabin perched on the side of the mountain overlooking the creek. Its three rooms are not much bigger than a chicken coop, but a fourth room sits 25 yards up the slope, its wooden seat cold and forbidding. With any luck, it would not be needed. I'm told the cabin was built largely from scrap narrow gauge railroad ties scattered by the 1940 flood. As a summer trout camp, it's adequate, but hardly the shelter you'd pick in a blizzard.

Kitchen conveniences are limited to a portable two-burner stove, a toaster oven and spring water piped into an old sink. Musty wool army blankets are piled on a bed in the tiny bedroom, and the living room barely holds a sagging cot, a decrepit arm chair, a ramshackle table and an oil lamp. There's electricity, but it's fragile.

You can see fire through gaps in the warped iron plates of the wood stove, and it draws so heartily it'll spin the damper like a windmill, threatening to suck the burning logs up the chimney. From a cold start, it can radiate a cozy 120 degrees in 10 minutes and have you basking in your drawers. But 45 minutes later, you'll be looking for your sweater and fetching another chunk of wood.

While the cabin warmed, I stepped outside and tapped the thermometer (22 degrees), then crunched through the still falling snow and cut some pine and hemlock boughs. Arranged on the table with a candlestick centerpiece, they began to release a fine seasonal aroma as I cut up beef and onions in an iron pot, then added peeled tomatoes, garlic, cumin, a bay leaf, cayenne and chili powder. The traditional blackeyed peas (canned, alas) would go on the fire in a couple of hours, and the toaster oven would reheat the homemade apple pie I'd brought.

I cached the milk and oysters for tomorrow's stew in a snow drift, swept a few shriveled critters out of the corners, and suddenly had nothing to do. I could go for a walk, read, perhaps take a nap, I thought. Or go fishing. Well, why not? I had brought my gear, though I couldn't say exactly why, and there would be plenty of time later for less active whims.

I did not actually expect to catch a fish, nor did it matter very much. Trout fishing does not require trout, just as virtue is not always its own reward. I filled my creel with images of black water running swiftly under lacy edges of ice, midstream rocks sporting snow caps, and remnant berries glazed like tiny candied apples.

Winter anglers, even introspective ones, leave a curious trail. When your feet become numb while wading, you are persuaded it will help to get out of the stream for a few moments. Very shortly, it will occur to you that the water, being still liquid, must surely be warmer than the snow, and you will wade back into the stream. You follow this circuitous route until you have one foot in the water and the other in the snow—both of them freezing—and the coffee pot is calling.

Just before midnight, full of chili, peas and pie, I walked up the road. The sky had cleared, and the stars sparked icy crystals. Somewhere, people were blowing noisemakers and keeping an eye on their designated drivers. Or perhaps there was no one left in the world. I could half believe it. And for one soul in one particular place on one New Year's, it was a world supremely at peace.

December, 1988
Volume 52, Number 12

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WILDLIFE IN NORTH CAROLINA

Wildlife in North Carolina is the official educational publication of the North Carolina Wildlife Resources Commission, and is dedicated to the sound conservation of the State's wildlife and other interrelated natural resources and the environment we share with them.

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written and photographed by Eugene Hester
A hunter drifting downriver in a boat will find bold, unwary squirrels and spooky wood ducks. It's an unbeatable combination.

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by Mark Taylor
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22 **Bird Dogs And Big Stakes**
written and photographed by Jane Rohling
For decades, the best bird dogs in the world have been tested in trials in these sandy, pine-rimmed fields near Hoffman, and the traditions are still going strong.

DEPARTMENTS

Our Natural Heritage *by Jim Dean*

Nature's Ways *by Lawrence S. Earley*

Back Of The Book *by Mark Taylor*

Cover *A gray squirrel basks in the winter sun, a common enough sight in many backyards. But go into the woods to hunt them, and squirrels become masters at hiding. Photography by Eugene Hester.*

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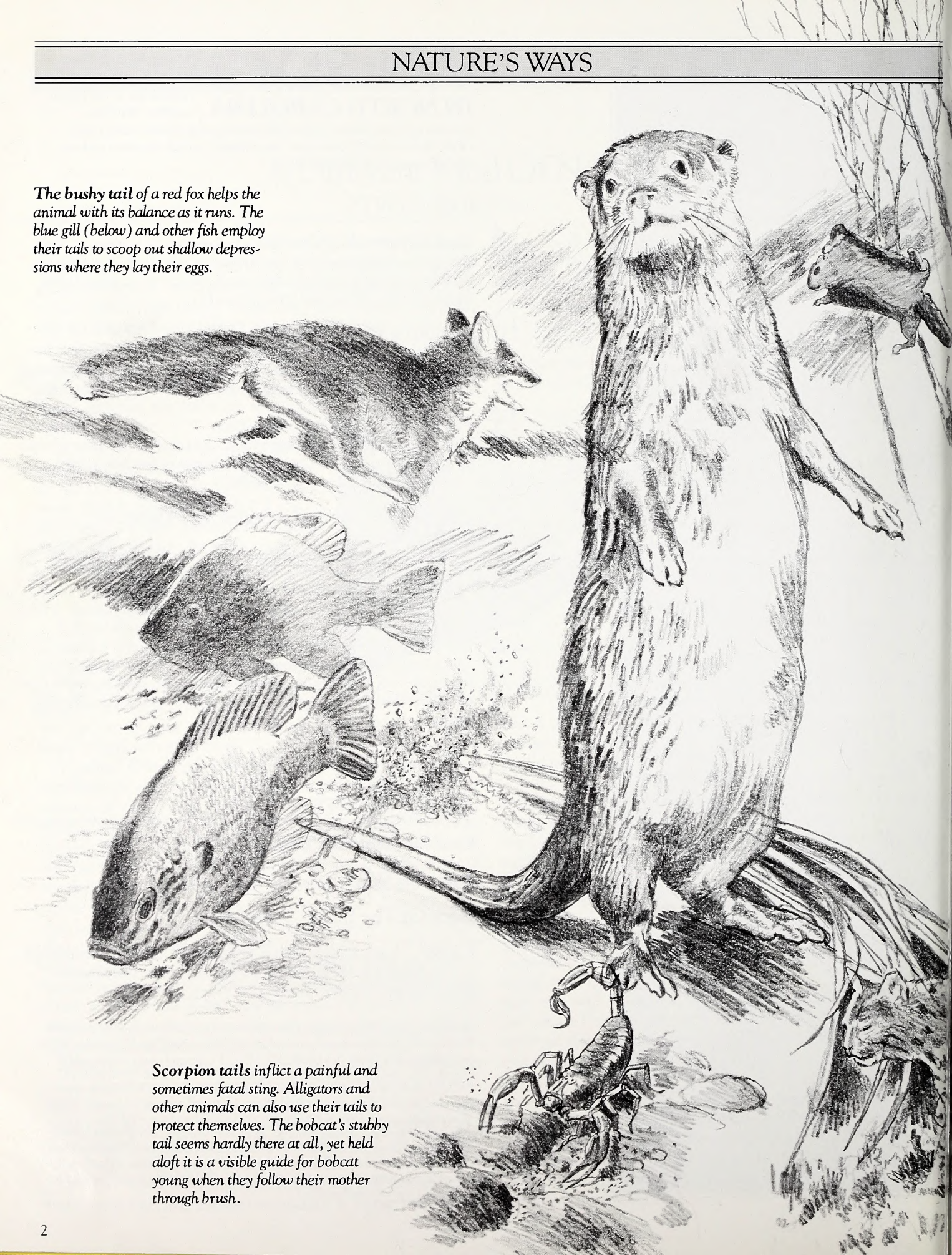


The bushy tail *of a red fox helps the animal with its balance as it runs. The blue gill (below) and other fish employ their tails to scoop out shallow depressions where they lay their eggs.*

Scorpion tails *inflict a painful and sometimes fatal sting. Alligators and other animals can also use their tails to protect themselves. The bobcat's stubby tail seems hardly there at all, yet held aloft it is a visible guide for bobcat young when they follow their mother through brush.*

Animal tails *serve a multitude of purposes. The river otter (left) uses its tail as a prop, to give it needed support when it wants to stand on its hind feet. The pileated woodpecker also uses its tail for support when it clings to the sides of trees. But tails also help guide the flight of birds and even flying squirrels.*

The Useful Tail

written by Lawrence S. Earley / illustrated by David Williams

When Pooch wants to go for a walk, all he need to do is stare at you with his chin pressed to the kitchen floor, and thump his tail hopefully. You get the message. If you don't, he'll thump his tail dejectedly until you reach for your coat. Then watch his tail come alive. Dogs' basic moods and needs can be read easily in the movements of their tails, which is one reason why a tail is so useful to them.

In fact, tails offer advantages to many animals, as only a brief look shows. Take the beaver for instance. Most of us know that the beaver's paddle-like tail makes a loud noise when slapped on the water, serving to warn other beavers when trouble is afoot. But beavers' tails also do other things. They are rudders, helping the beaver turn and propel itself in the water. They're a prop when the beaver wants to stand on its hind legs to carry mud and sticks to its lodge. And they store fat, holding it in ready reserve for harsh winters when ice may keep the animals from food for months.

Tails are also marvelous communicators, as we know from Pooch. When the bobcat mother holds her stubby tail aloft as she pads through tall grass, the contrasting colors — white underfur and dark fur on top — are a perfect guide for her youngsters. An alarmed white-tailed deer will flash the white underparts of its tail and visually communicate its fear to every animal in the vicinity. Squirrels will bounce their tails up and down when they are alarmed, visually alerting other animals as well.

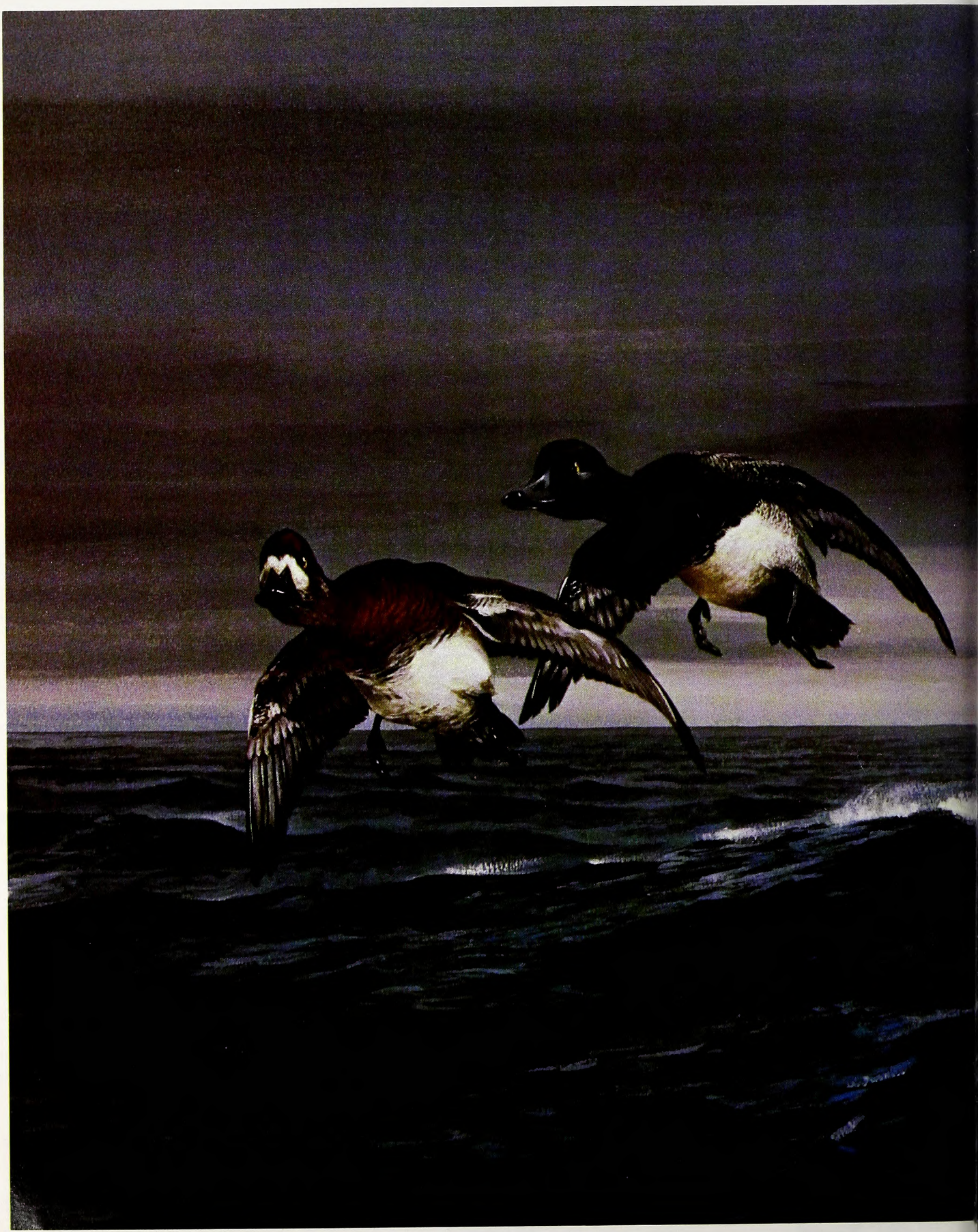
Some tails are perfect for support, as when the woodpecker gains the leverage it needs to excavate a tree cavity by propping its body away from the tree with its stiff tail feathers. Chimney swifts' stiff tail feathers also help them cling to the sides of walls and inside hollow trees. Raccoons brace themselves with their tails when they sit on their haunches.

Without a tail, a fish couldn't move forward in the water and neither could an alligator. But other animals also use their tails to aid in moving. Foxes use their bushy tails to help them balance when making a running turn, and squirrels employ their tails as a counterweight when they are negotiating the thinnest, topmost branches of a tree.

Tails sometimes are handy tools, as when the opossum wraps its prehensile tail around a tree limb to steady it as it goes. Or when the bluegill or trout employ their fins and tails to scoop out hollows for their eggs in sand or gravel.

Tails are sometimes weapons: Never get in the way of the alligator's tail and watch out for scorpions. Tails can be employed as life-saving diversions: Carolina anoles and other lizards often drop their tails in times of danger. In some species, tails are important in courtship: Gobbler turkeys and peacocks display their tail feathers in an astonishing way when they want to impress females. Tails are warm, too: In winter, foxes, woodchucks and other furry animals sleep with their tails wrapped around them. Sometimes they cool an animal down: Squirrels often arch their tails over their bodies to block the sun on a hot day.

Some anthropologists surmise that long before tight skirts and blue jeans were invented even humans had tails. No doubt they were as useful (and perhaps handsome) as many other animal tails and we can only regret the loss.



Last Chance For Ducks?

Populations of many ducks are precariously low because of drought and dwindling nesting habitat, and their future may rest on the success of the North American Waterfowl Management Plan.

by Lawrence S. Earley

By any measure, the drought of 1988 has secured a place in the record books as one of the worst of the century. Last summer's fires swept tinder-dry national forests throughout the West, burning over practically the whole of Yellowstone National Park and stirring controversy over the U.S. Forest Service's fire policies. As the hot midwestern winds rattled fields of shriveled corn and farmers stared hard at ruin, Conservation Reserve acreages were thrown open for haying. According to one estimate, the cost of the emergency measure was 500,000 ducks. By May, the U.S. Fish and Wildlife Service was predicting that the drought would have a catastrophic effect on duck reproduction. By summer's end those suspicions were confirmed.

According to the Fish and Wildlife Service, the U.S. duck population fell by 8 million birds in 1988. "We are predicting a fall flight of 66 million birds, the second lowest on record," said Fish and Wildlife Service Director Frank Dunkle. He urged

Alone on the Lake — Bluebills
by Lynne R. Kaatz

Artist's rendering of two bluebills alone on a wintry day symbolizes the plight of many duck species after the summer's drought decimated their numbers.

courtesy of the artist and Voyageur Art
P.O. Box 21321
Minneapolis, Minnesota 55421

Bad Weather Bluebills
by Chet Reneson

Hunting seasons will be shorter this year because of the drop in duck populations (above).

courtesy Wild Wings
Lake City, Minnesota 55041

Blue-wing Teal
by David A. Maass

Blue-wing teal (right) are one of the 10 duck species especially hard-hit by drought in the prairie pothole country of North America.

courtesy Wild Wings
Lake City, Minnesota 55041

states to reduce their bag limits by one and their waterfowl hunting seasons by 25 percent. Some sportsmen were even calling for a voluntary moratorium on duck hunting to protect the vulnerable populations. "This is much worse than during the Dust Bowl days of the 1930s," said David Zentner, of the Izaak Walton League of America.

Yet if the parched summer did one good thing, it underscored the wisdom of the North American Waterfowl Management Plan, a cooperative waterfowl rescue effort signed in 1986 by both the United States and Canada. (Mexico has signed a memo of agreement but is not yet a signatory of the document.) Hailed as "the largest single effort ever undertaken to protect wetlands and waterfowl," the Plan aims to boost duck populations by the year 2000 to levels not seen since the mid-1970s.

The need for the plan was recognized long before last summer's searing drought. Indeed, the alarming decline in duck populations only continues what has been a 10-year trend. Since 1980, waterfowl populations — especially duck populations — have fallen to some of their lowest counts on record. Ducks hit their all-time breeding lows in 1985 and it was in the shadow of that year that the idea for the North American Plan was formed.

The problem is frightening. In 10 years, mallard populations have fallen from an average of 8.7 million to 5.5 million, and blue-winged teal populations from 5.3 million to 3.8 million. In the most startling plunge of all, pintails, with a 1970s population average of 6.3 million, plunged to 2.6 million this spring. The black duck, steadily losing numbers over the past 30 years, has fallen to fewer than 300,000.

It's not a uniformly depressing picture for waterfowl. Canada geese and swans haven't been harmed by the drought primarily because their nesting grounds are in Alaska and the Arctic where water is more available. Some duck populations have even increased during the year—widgeons by 16 percent and redheads by 10 percent.

Yet for many duck species the last 10 years has been a disaster, and it's no surprise that loss of nesting and winter habitat in Canada and the United States is the main culprit. In the prairie regions of the upper midwest and Canada, the drought has dried up hundreds of the potholes that provide nesting habitat for so many North American ducks. In previous years, these wetlands would have been too muddy to cultivate, but farmers have taken advantage of droughts by plowing and planting them. Even before this year's drought, farmers were cutting grassy areas adjacent to marshes, trying to wring every last acre for crops. These grassy areas provided crucial cover for duck nests.

Today North Dakota has only 2 million acres of wetlands out of an original 5 million while in neighboring Minnesota 1.4 of 8.7 million acres of wetlands remain. Iowa has barely 70,000 acres out of its former 1.1 million wetland acres. With fewer wetlands for nesting, duck reproduction has plummeted and ducks that have been able to nest are concentrated in smaller and smaller patches of habitat, making them vulnerable to predators. Some ducks have flown over their former prairie habitat to search for nesting habitat farther north, a flyover that consumes body energy and usually results in

courtesy Wild Wings Lake City, Minnesota 55041

Spring Reflections by Phillip Crowe

Populations of pintails (above) have fallen drastically since the 1970s. The North American Waterfowl Management Plan seeks to more than double the present-day numbers of this species by the year 2000.

courtesy American Masters Foundation Inc.
10688 Haddington, Suite 200
Houston, Texas 77043

poorer breeding condition and fewer eggs. In the 1970s there were 62 million breeding pairs of ducks; today there are 32 million.

The North American Waterfowl Management Plan is a policy framework that sets broad goals for waterfowl populations in general, and then goals for specific waterfowl species. By the year 2000, it aims to raise the breeding population back to 62 million birds with a fall flight of 100 million. Pintails and mallards would be restored to a mid-70s average of 6.3 million and 8.7 million respectively and the black duck populations on the East Coast would be stabilized at about 385,000 wintering birds.

The key to restoring ducks to their former numbers is the protection and enhancement of habitats that still remain. The Plan seeks to protect nearly 6 million acres of nesting, migrating and wintering habitat in the United States and Canada through a unique process called the "joint venture." The joint venture is a regional action group consisting of representatives of state and federal governments, conservation groups, corporations and private citizens. Six joint ventures have been formed, each responsible for protecting key waterfowl habitats in specific areas of the country: prairie pothole country, the Central Valley of Californa, the Gulf Coast, the Lower Mississippi Valley, the Lower Great Lakes/St. Lawrence basin, and the Atlantic Coast.

"The joint venture is the ideal way to get national goals accomplished by relying on local initiative," says Dick Hamilton, assistant director of the N.C. Wildlife Resources Commission and a representative of the Atlantic Coast Joint Venture. "It pulls together representatives of state and federal governments, conservation organizations and private citizens to identify specific habitat needs and decide what needs to be done." Some of the conservation groups that are willing partners in this undertaking are Ducks Unlimited, the National Wildlife Federation, The Nature Conservancy, the National Rifle Association and others.

"Joint ventures might acquire land or they might

come up with ideas for new laws to protect critical wetlands," says Hamilton. Direct acquisition is the surest way to protect critical habitats, but it's also the most costly. Hamilton says that joint ventures will also be recommending quicker, less costly methods to protect wetlands, including financial incentives to farmers and zoning ordinances or land-use plans by local governments. Each joint venture will be responsible for finding and allocating money, and for monitoring the progress it makes until the year 2000.

For the Atlantic Coast Joint Venture the black duck is the key species. One of the goals set forth by the Plan is to find an additional 50,000 acres of migration and wintering habitat along the East Coast. As of late September, the technical committee, consisting of waterfowl specialists from state wildlife agencies along the East Coast, was assembling a final report that listed important black duck habitat from Maine to South Carolina. Several areas in North Carolina have been proposed, according to Dennis Luszcz, Wildlife Commission biologist and North

Mallard Suite
by David A. Maass

Winter duck habitat like this wetland slough has disappeared throughout vast areas of the south, while nesting habitat in the Midwest and Canada has been lost to drought and aggressive agriculture. The result is fewer ducks.

courtesy Wild Wings
Lake City, Minnesota 55041

Carolina's representative on the joint venture's technical committee. "Some areas that we've identified as critical to black ducks and other waterfowl in our state are the Roanoke River delta, Currituck Sound and the marsh impoundments adjacent to Pamlico Sound," Luszcz says. These areas will be added to those from other states and a priority list of projects will be put together for each joint venture.

It'll take money to reach the goals set by the North American Waterfowl Management Plan — an estimated $1.6 billion through the year 2000. Uncle Sam will kick in some money through the Duck Stamp program and the Wetlands Protection Act, but the hitch is that the federal government foresees few budget increases for land acquisition or habitat maintenance. That leaves states and private organizations to do the heavy work of fund-raising. "We'll be trying to come up with some innovative ways to fund the joint venture projects," says Dick Hamilton. "For example, we may want to set up challenge grants for some projects. Instead of funding a particular project entirely, we might commit half of the estimated project cost from federal funds and encourage state and private efforts to match funds."

"North Carolina has a good chance of getting funding for some high-priority projects," adds Hamilton. "One reason is that Currituck Sound is the wintering grounds for many of the ducks in the Atlantic Flyway."

It remains to be seen whether this unprecedented international effort to stem the losses of waterfowl will work, but one thing is certain. This year's abbreviated hunting season has brought the problem front and center before America's sportsmen and it is doubtful that they will remain unmoved by the plight of waterfowl. No one knows whether the worst of the drought is over, but even if it is, the problems facing ducks stretch on into the future. "It is evident that it will take at least several years of good weather to rehabilitate the wetlands so vital to breeding waterfowl," said the Fish and Wildlife Service's Director Frank Dunkle. In the meantime, and at least until the year 2000, the best hope for ducks is the North American Waterfowl Management Plan. ⊠

Sneaking Down The RIVER

A hunter drifting downriver in a boat will find bold, unwary squirrels and spooky wood ducks. It's an unbeatable combination.

written and photographed by Eugene Hester

We sat there, perfectly still, looking through the woods for the slightest sign of motion and listening for any sound. Our small johnboat barely moved in the sluggish current, and we paddled only enough to keep the boat headed downstream. The rumbling of commuter traffic on a distant highway was a subtle reminder that we weren't far from civilization and the routine of daily work in the city. But our immediate surroundings along this Piedmont river were uninhabited.

Suddenly, we heard something scurrying through the leaves. As we watched and waited, I made a few backward strokes of the

***Drifting small creeks** and rivers is a pleasant and productive way to hunt squirrels and ducks, especially if you pick a creek where the water's not too low or blocked by deadfalls. Safety dictates a paddler in the rear and only one hunter up front.*

paddle to slow the boat, then reached for a low-handing tree limb to hold us in place.

The noise in the woods grew louder. My son, Jason, and I both recognized that this was not likely to be one of those false alarms caused by little birds scratching in the leaves. Jason glanced at me, nodding, and turned again toward the sound, then raised his shotgun and held it ready.

Moments later a squirrel scampered up an oak tree and paused on a large limb. Jason's well-aimed shot found its mark, and the squirrel tumbled through the tree limbs to the forest floor. We sat still, waiting and watching to see if there might be other squirrels nearby. After a minute or two of silence Jason went ashore and got the squirrel.

"You know, this is the closest I have ever been able to get to a squirrel," he said as he examined his kill.

That comment summarizes a lot of squirrel hunting experience for most of us. It also explains why a river float trip for squirrels—ducks, too—can be so successful.

Since that day Jason has floated a lot of rivers with me. So have his brother Tom and cousin William, and most of our trips have been successful. We almost always end up with a few squirrels and occasionally get a wood duck or two.

Over the years we have developed several techniques that work for us. It's not only an effective way to hunt, it's relatively simple. Even so, there are some tips worth knowing.

First, we try to arrange our hunts at times when both the squirrel and duck seasons are open because that doubles the excitement and adds variety to the hunt.

One of the hardest things to estimate is the length of time a float trip will take. There seems to be an inevitable tendency to underestimate the amount of time needed. Maybe it's because there are always more logs and other obstructions than we anticipate. Or perhaps it's because we pause along the way to check on sounds more than we expected. Frequently, the current isn't as swift as we expected, and we have to paddle most of the way. For all these reasons, and others, the trip takes time.

For the small creeks we float, we have developed a rule of thumb. We allow two hours per mile. That gives us plenty of time to pull the johnboat over logs and beaver dams as well as to stop along the way to sit and watch and listen. After all, why get in a rush when there's so much to see? When we float a river new to us we always go for half a day, starting at daybreak. That way, if we misjudge the time we still have plenty of daylight left to get out. Also, if that works out right for us, we figure we can go about twice that far in a full day.

Geological Survey maps are a great help in planning such river float trips. They give details of the major curves, islands and tributaries of the river and also show dams and rapids, as well as railroad and road crossings. These maps are likely to be available locally, but if you can't find them, write to the Distribution Branch, U.S. Geological Survey, Box 25286, Federal Center, Denver, Colorado 80225 and ask for a free index map of North Carolina. It will contain instructions for ordering maps of the areas you intend to hunt.

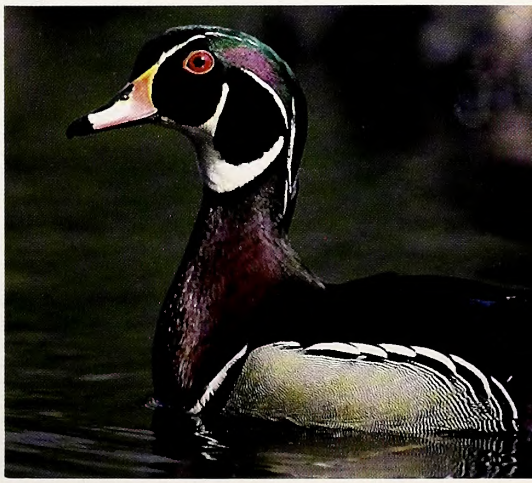
County road maps can also be useful because they enable you to recognize roads that cross the stretch of river you plan to float, and will help you locate potential launch and take-out points. As with Geological Survey maps, you can use these to estimate river mileages, but county maps contain less detail about the rivers and distances because they were not prepared for that purpose.

Maps can cause problems because they are always either wet from lying in the bottom of the boat, or folded in a coat pocket where they're inaccessible. Our solution is to fold the map so the areas of interest are visible, then wrap the map around a piece of heavy cardboard—an 8-inch by 10-inch piece is about right. Both sides can show the desired section of the river, and we simply flip the map over when we pass the point at the fold. To waterproof it, we place the map and cardboard in a plastic bag, pushing the air out and sealing it.

Though we haven't turned a boat over in a long time, we have found that it's a good idea to also put our billfolds in plastic bags before the trip. After sealing them, we put them back in our pockets. When we're pulling the boat over a beaver dam and step into a hole, our clothes might get wet, but not our billfolds.

Sometimes, especially if the weather is very cold, it's a good idea to put a change of clothes into a plastic garbage bag and slip this under a boat seat. It works out that most hip boots or waders are never quite tall enough and dry clothes certainly improve the enjoyment of the trip. A small flashlight

***On many creeks,** wood ducks offer a bonus for float hunters, and these colorful ducks are even more wary than squirrels. Unlike some waterfowl species, wood duck populations are up.*



is another useful good addition, especially if your float trip takes longer than you expected.

For safety we wear vest-type life preservers that are light enough to be comfortable—the same type we use for fishing. We have found that we can effectively shoot while wearing one. It's also essential to unload the shotgun before pulling the boat over logs or making portages.

From our many float trips we have concluded that the greatest hazards are rapids. Usually we can hear or see them far enough ahead to take adequate precautions, including a portage through the woods if necessary. There is no substitute for familiarity with the river, and a scouting trip before hunting season while the weather is mild is a great help in planning for the hunt.

We like small creeks about 25 feet wide because they have a lot of food and cover for squirrels and ducks. They also have a lot of obstructions such as fallen logs and beaver dams. By carrying a pair of large lopping shears and a small bow saw, you can also remove a few of the fallen tree limbs and overhanging vines to make tight passages easier and safer. You don't want to open it up too much—just remove a few of the more troublesome obstructions.

"If the river were more open, a lot of people would be using it," my son Jason remarked one day as we struggled past an obstruction. "And if it had more logs we would question whether it was worth that much effort. So it must be just about right."

It's not unusual to see game animals other than squirrels and wood ducks. Occasionally we flush mallards or black ducks or see a raccoon asleep in a tall tree. Once we flushed a marsh or bluetail rabbit from a clump of brush on a tiny river island. We've also seen two river otters and a beaver. Pileated woodpeckers, great blue herons, red-tailed hawks and barred owls provide occasional variety and excitement. All of these sightings enhance the pleasure of floating a river.

Since paddling is necessary to guide and propel the boat, we find that it works best—and is far safer—for one person to hunt and one person to paddle. The person on the front seat holds the gun, ready for action while the one in back does the paddling. The boat is easier to control from the back, and that person is out of the way of the hunter. After a shot or a kill, you can switch places.

***William Hester** admires the results of a successful drift hunt — a fat greenhead mallard and a brace of bushytails. A good float hunt takes planning and coordination, and it's best to scout the river before the season.*

***Oddly, while** squirrels are extremely wary of any threat they see or hear on land, they often virtually ignore hunters drifting down a creek in a small boat. For one thing, there are no dry leaves crunching underfoot.*

Some hunters prefer to switch places on the basis of time, perhaps alternating each hour.

You'll find that some sections of a river may have more squirrels than other sections. We find most squirrels in oak and hickory forests, few in pines. Marshes have no squirrels, but may have ducks. Swamps of cypress and gum trees may yield a combination of ducks and squirrels.

Wood ducks may be feeding or loafing almost anywhere along a creek, but generally they prefer sections with thick cover and shallow water. Somehow they always seem to see us before we see them, and flush while still out of range. But sometimes they will swim behind a log or brush to hide at the edge of the river. By watching closely we can see the small waves they create while swimming, and this tips us off so we can get ready when they flush.

Ducks almost always flush and fly away from us, going downstream, but we have learned that they will frequently come back, flying higher, and pass directly overhead as they go upstream. By watching for this, we have often gotten a second chance at them. Because of the variety of shots, and the fact that we're hunting both squirrels and ducks, we choose a shotgun and use No. 6 shot with a strong load of powder.

It's a good idea to check hunting regulations before you go. Carrying loaded firearms in a boat is prohibited in a few counties, for example. Remember, too, that in addition to a hunting license, a federal migratory waterfowl stamp is required for waterfowl hunting by hunters 16 years old or older. It's also important to know about land ownership along the river and respect the owner's rights.

Since a river float trip starts at one place and ends several miles downstream, it is necessary to arrange vehicle transportation in advance. Sometimes we have someone drop us off at a road bridge and then pick us up at a downstream bridge at an appointed time. More often, we use two vehicles, and park one at the downstream bridge, then drive the other one with the boat to the upstream launch site. The obvious advantage is the timing doesn't have to be so precise since nobody is waiting at the downstream bridge.

Perhaps the most surprising thing about this kind of hunting is the lack of wariness displayed by squirrels. They apparently don't recognize hunters in a boat as a threat. We once saw a squirrel in a tree along the river bank, and because the squirrel was on the far side of the tree, I urged my son Tom to go ashore to get a better shot. The moment Tom stepped on shore, the squirrel quickly moved around the tree to the river side. My efforts from the boat to get the squirrel to go back to the shore side were in vain. He ignored not only my shouts, but my waving hat and arms. But he remained very much aware of Tom's motionless presence on shore.

That kind of experience is part of the mystery and unexpected pleasure of float hunting. Something new always lies just around the next bend. ⊠

A Legacy Of Trout

From Indian spears and bone hooks to corn and dry flies, the history of trout and trout fishing in North Carolina is celeberated in this display at the Mountain Heritage Center in Cullowhee.

written by Jim Dean
photography by Ken Taylor

An 1840 lancewood *rod is part of this exhibit of early trout tackle.*

It seems a most unlikely season for trout fishing. The wind howls past the eaves carrying cold rain or sleet, and many of our favorite streams are dusted with snow, the pools rimmed with ice. Yet, now is the time the serious fisherman indulges his passion to its greatest extent — angling in the streams of memory and imagination.

Jan Davidson knows all about that. He's a fisherman and also curator of the Mountain Heritage Center at Western Carolina University in Cullowhee. That combination led directly to the exhibit now on display in the Center. Here, amidst a mixture of early photos, paintings of trout, century-old patterns of flies, old rods, reels and other angling artifacts, Davidson has sketched the history of trout and trout fishing in North Carolina. He had ample help from Curtis Wood, David Brewin, Michael Kline and director Tyler Blethen.

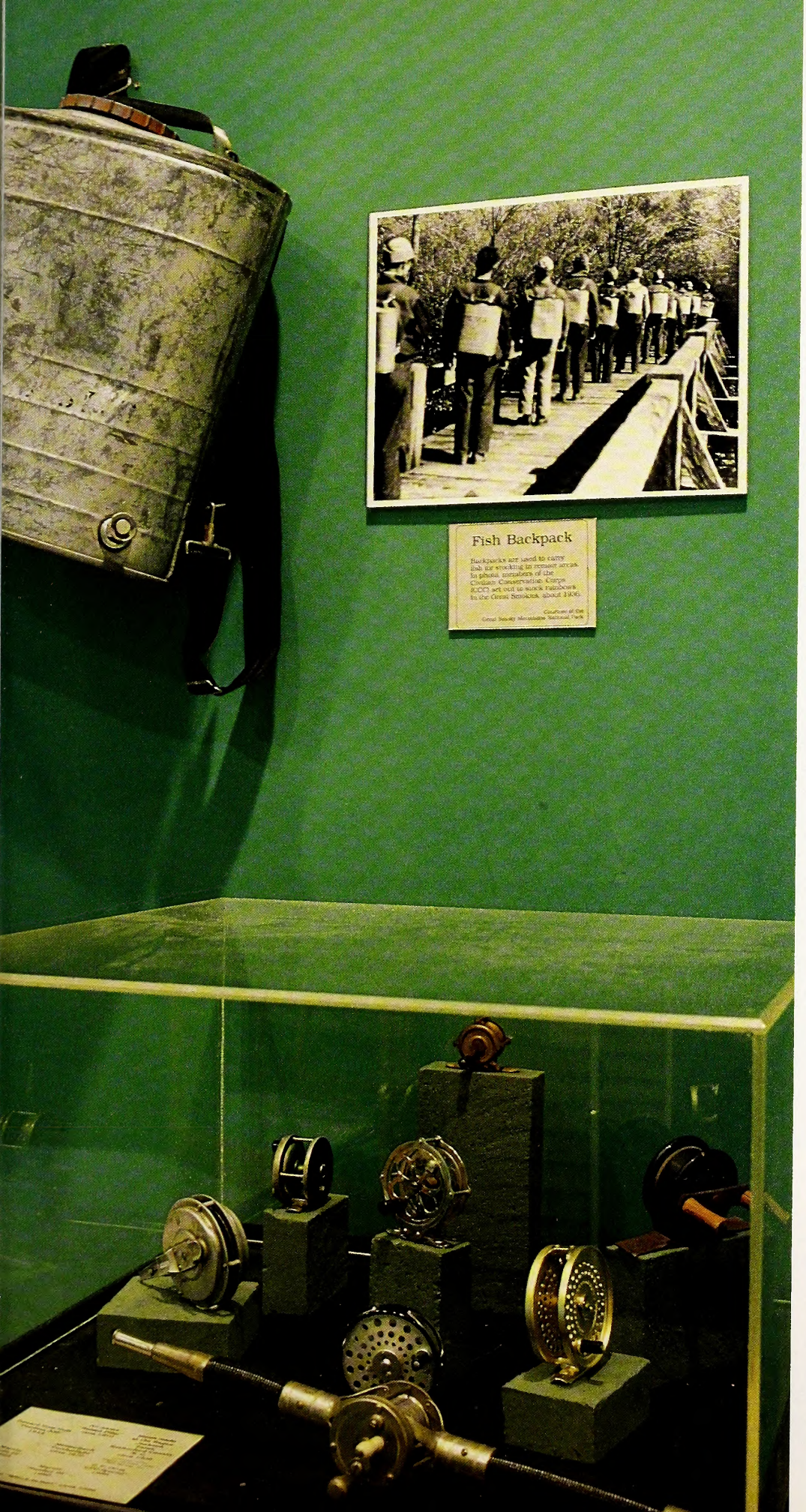
Trout and salmon *flies tied by Mary Orvis Marbury in 1872 are on loan from the American Museum of Fly Fishing. Records indicate the Cherokees constructed floating flies using thin strips of deer hair to catch surface feeding trout in the streams of the Great Smokies long before the white man arrived.*

"When we first thought of preparing such an exhibit, we realized the history and impact of trout fishing in western North Carolina would be perfect for our mission here at the Center. Our focus is history, folklore and natural systems within the mountain region — and trout fishing fits every criterion."

Not surprising to Davidson, the display has been popular. Each year, an estimated 25,000 visitors tour the Mountain Heritage Center located at the entrance to Western Carolina University on Rt. 107. The Center is open 8-5 weekdays, 2-5 on Sundays, and is closed on Saturdays. The trout exhibit opened this past June, and will remain on display through August 1989.

"While digging up the material for the exhibit, we found a wealth of material, more than we could actually use," said Davidson. "We know that brook trout are the only native trout in the state — actually, they're char — and that's what the Indians and early settlers fished for in our streams. There weren't any brown or rainbow trout here then — rainbows are from the Pacific Northwest, and browns came from Europe.

"The early records of trout stocking may not be complete, but they are fascinating," said Davidson. "For example, the first record we found of trout being stocked in the State goes back to 1877 when Confederate General Wade Hampton of South Carolina began to raise brook trout in some ponds on his summer place near Highlands. He began privately releasing some of these brook trout into streams in that area where



Portable fish *stocking tanks (upper left) were used to backpack live trout into remote streams. In the old photo, members of the Civilian Conservation Corps begin a stocking trek in 1936. Below, reels used by fishermen in North Carolina beginning about 1870 were not fancy, and some were even home-made. The black reel with wooden handles (upper right in display case) was made on a farm in Polk County prior to 1940.*

***With thousands** of species of mayflies, stoneflies, caddis, terrestrial insects and other forms of trout food to duplicate, fly tying has become an intricate art form and a "hobby within a hobby."*

***Early black** and white photographs show men, women and children fishing for trout on North Carolina streams. Though fly fishing was not unheard of, most fishermen used natural baits such as "stickbait" (caddis larvae), worms, grasshoppers, crickets, helgrammites and minnows.*

the trout had apparently been depleted.

"Government trout stocking soon followed," said Davidson, "and the U.S. Fish Commission had a cooperative stocking program with the state to stock 36,000 brook trout as early as 1879."

Davidson learned that the first rainbow trout were apparently stocked in 1880 on the eastern face of the Blue Ridge in the streams on the upper Catawba River drainage. The state tried to establish a rainbow hatchery at Swannanoa Gap in 1879, but cold weather forced a move the following year to Morganton where trout were raised on the grounds of the State Insane Asylum. That year, records show that 4,300 rainbows were split up and stocked in Mill Creek in McDowell County, Upper Creek and Johns River in Burke County, Swannanoa River in Buncombe County and several private ponds.

By 1890, brown trout had also been stocked — most likely in streams in the same general area along the Eastern slopes of the Blue Ridge — although records are incomplete, and Davidson is still seeking more information on the early introduction of browns.

"Our exhibit occupies about three-fourths of the Center, and we now also have a 20-minute slide show in which older anglers talk about the methods they used and places they fished years ago,"said Davidson. "Adjacent to the exhibit is an aquarium that holds species of trout found here."

Support for the exhibit in the way of contributions, display items and information has come from a variety of sources. Old photos came from the Southern Historical Collection at UNC-Chapel Hill, UNC-Asheville and N.C. Archives & History. The American Museum of Fly Fishing in Manchester, Vermont provided some of the old flies, tackle and information. Some photos and tackle were also provided by private collectors.

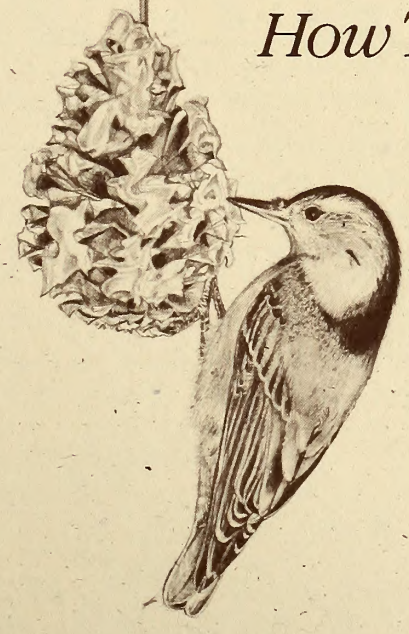
"The Wildlife Resources Commission helped with our largest contribution," said Davidson. "Other sponsors include four chapters of Trout Unlimited — Tuckaseigee, Blue Ridge, Land O' Sky and Rocky River. Several private sponsors also contributed — Ms. Alice Bourne, Richard Jennings, C.R. Brown Co. in Andrews, and The Brookstowne Angler in Winston-Salem."

Davidson hopes the exhibit will be able to go on the road sometime after it closes in August. "But we're not certain of that yet," he said. "I think it tells a unique part of our sporting history in western North Carolina, and I think anglers elsewhere would enjoy it."

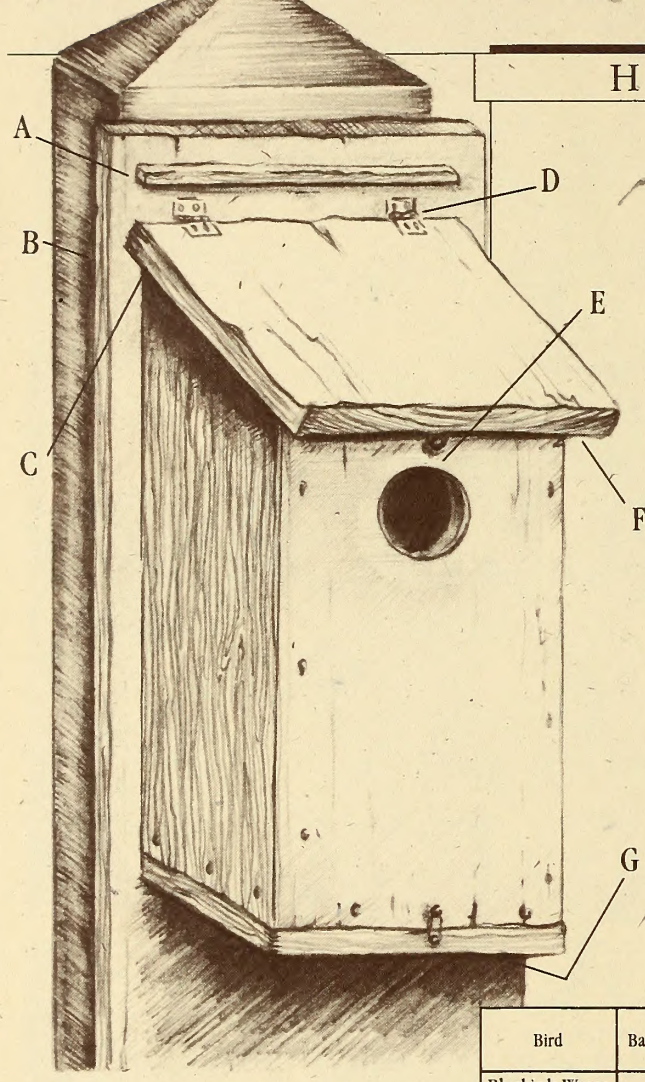
Not only that, it would be good therapy for those fishermen who might not get to fish as often as they like. If you can't go fishing, maybe the fishing can come to you. ☒

Bird Houses & Feeders

How To Build And Enjoy Them



DIVISION *of* CONSERVATION EDUCATION, NORTH CAROLINA WILDLIFE RESOURCES COMMISSION



CONSTRUCTION NOTES

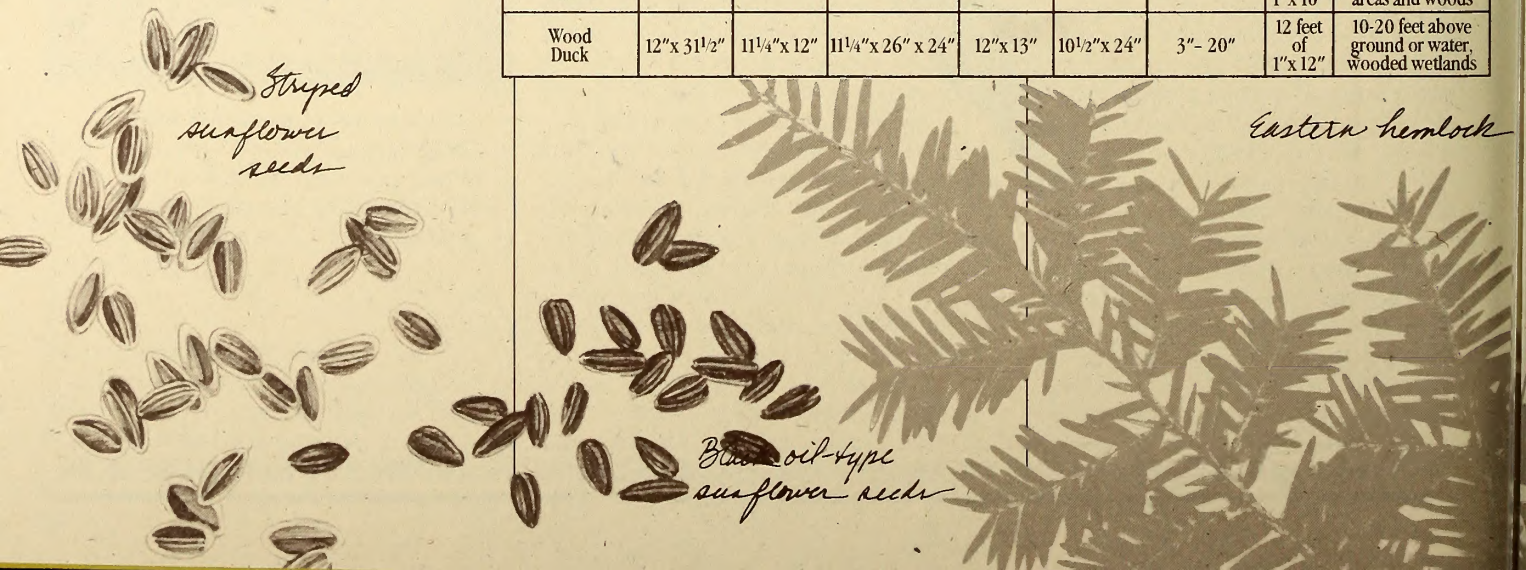
A. A small strip of molding prevents leakage.
B. Backboard extends 2 inches above and below bird house, and ¼-inch beyond its sides.
C. Cut or plane roof flush to backboard.
D. Roof and floor attached to backboard with two pairs of small hinges. Use two pairs of small screw eyes to wire shut during the nesting season.
E. An optional predator guard (not shown) may be made by drilling the same sized entrance hole through a separate piece of wood which spans the width of the bird house. Line up the entrance holes, and tack this plate to the front. This makes it harder for predators to reach into the box.
F. Roof overhangs front to shed rain and snow.
G. Drill several small drain holes (¼-inch) in floor to provide ventilation and keep inside dry.

UNIVERSAL BIRD HOUSE

This universal bird house is suitable for many birds. The table to the right gives the dimensions of its parts for various species.

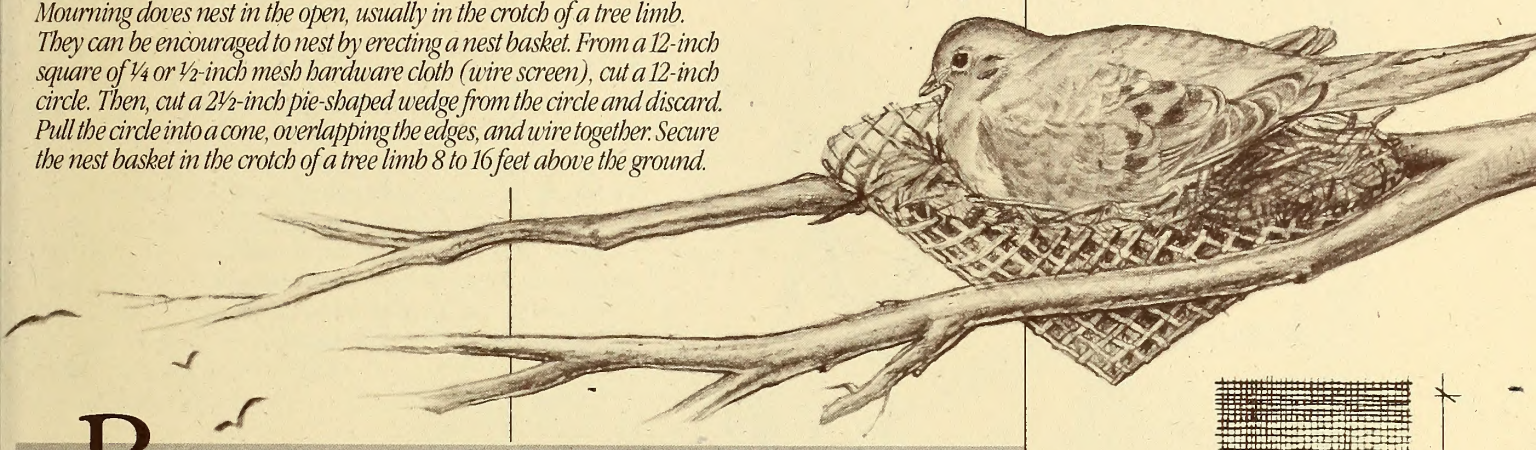
The hinged top and bottom allow monitoring of the nest and easy clean-out after the nest has been abandoned.

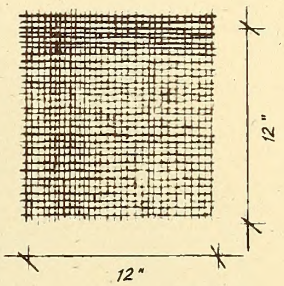
Bird	Backboard	Floor	Sides Width-Long End-Short	Roof W x L	Front	Entrance Diameter Height to Center	Wood Needed	Placement
Bluebirds, Wrens Chickadees, Swallows, Nuthatches, and Warblers	7″x 15½″	5¾″x 6½″	5¾″x 10″x 9″	6⅝″x 7″	5″x 9″	1½″ 6¾″	5 feet of 1″x 8″	4-10 feet above ground, backyards and edges of fields and woods
Finches, Flycatchers, Sparrows	8″x 17½″	6¾″x 7½″	6¾″x 12″x 10″	7⅝″x 8⅜″	6″x 10″	2½″- 7¼″	6 feet of 1″x 8″	8-20 feet above ground, backyards and open areas
Downy Woodpecker	6″x 15½″	4¾″x 5½″	4¾″x 10″x 9″	5⅝″x 6⅛″	4″x 9″	1¼″- 6½″	4½ feet of 1″x 8″	5-15 feet above ground, backyards and open areas
Hairy, Red-headed, Red-bellied Woodpecker	8″x 20½″	6¾″x 7½″	6¾″x 16″x 14″	7⅝″x 8½″	6″x 14″	2½″- 11½″	8 feet of 1″x 8″	10-20 feet above ground, woods and clearings
Common Flicker	9″x 23½″	7¾″x 8½″	7¾″x 18″x 16″	8⅝″x 9¾″	7″x 16″	2½″- 14″	8 feet of 1″x 10″	6-30 feet above ground, open areas and woods
Wood Duck	12″x 31½″	11¼″x 12″	11¼″x 26″ x 24″	12″x 13″	10½″x 24″	3″- 20″	12 feet of 1″x 12″	10-20 feet above ground or water, wooded wetlands



DOVE NESTING BASKET

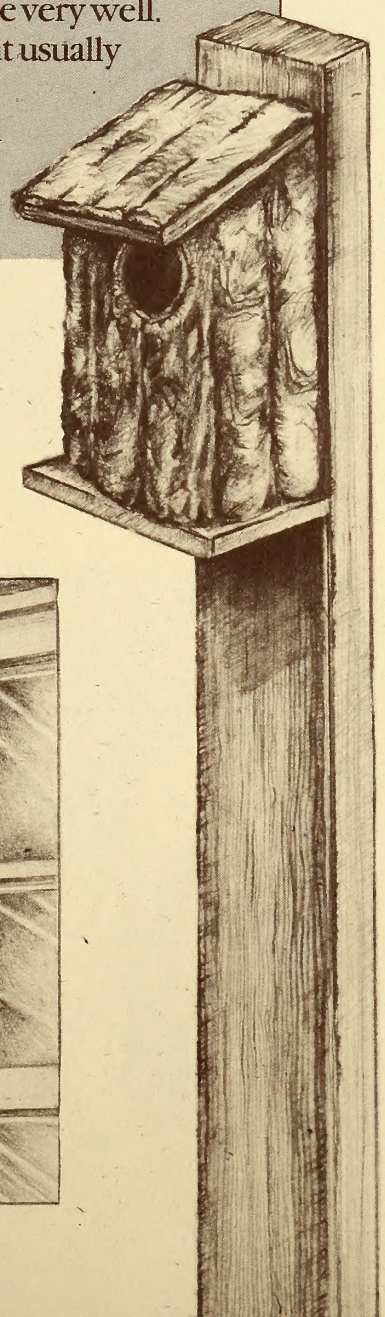
Mourning doves nest in the open, usually in the crotch of a tree limb. They can be encouraged to nest by erecting a nest basket. From a 12-inch square of ¼ or ½-inch mesh hardware cloth (wire screen), cut a 12-inch circle. Then, cut a 2½-inch pie-shaped wedge from the circle and discard. Pull the circle into a cone, overlapping the edges, and wire together. Secure the nest basket in the crotch of a tree limb 8 to 16 feet above the ground.

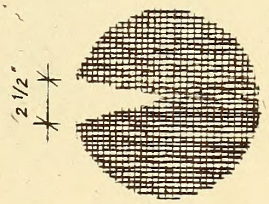




BIRD HOUSES can be as simple or elaborate as you wish to make them. These basic designs will serve very well. Additional creative touches will do no harm, but usually mean more to the builder than to the birds.

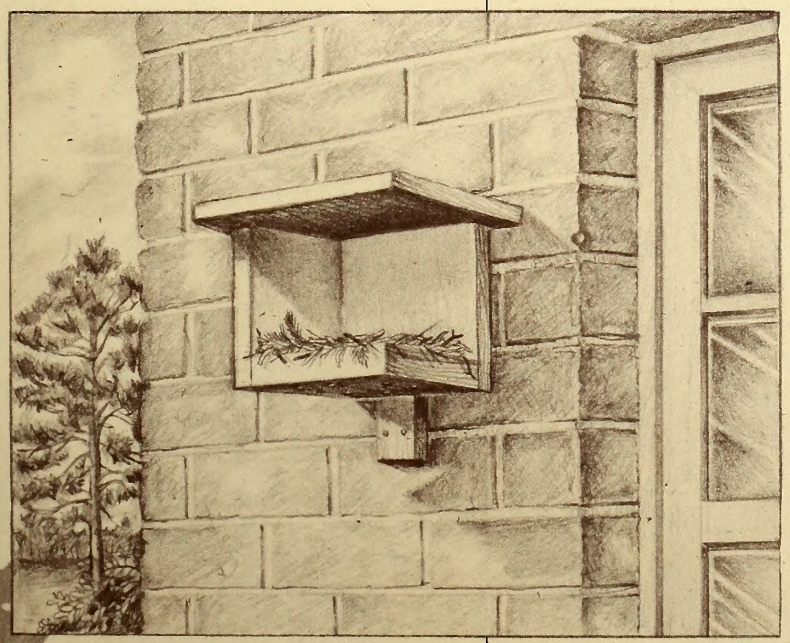
Bird houses should be placed near natural cover. If a house is not used after a season, however, try moving it to a new location.





NESTING SHELF

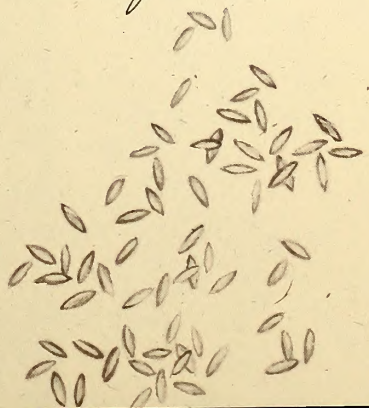
Robins, barn swallows and phoebes don't need cavities for nesting, but will use this simple nesting shelf. Dimensions can vary. However, the bottom should be at least 6 by 8 inches, and the sides should be a minimum of 6 inches high on the short side. Angle one side so the roof will shed rain. Mount nesting shelves about 10 feet off the ground on a tree trunk or the wall of a building.



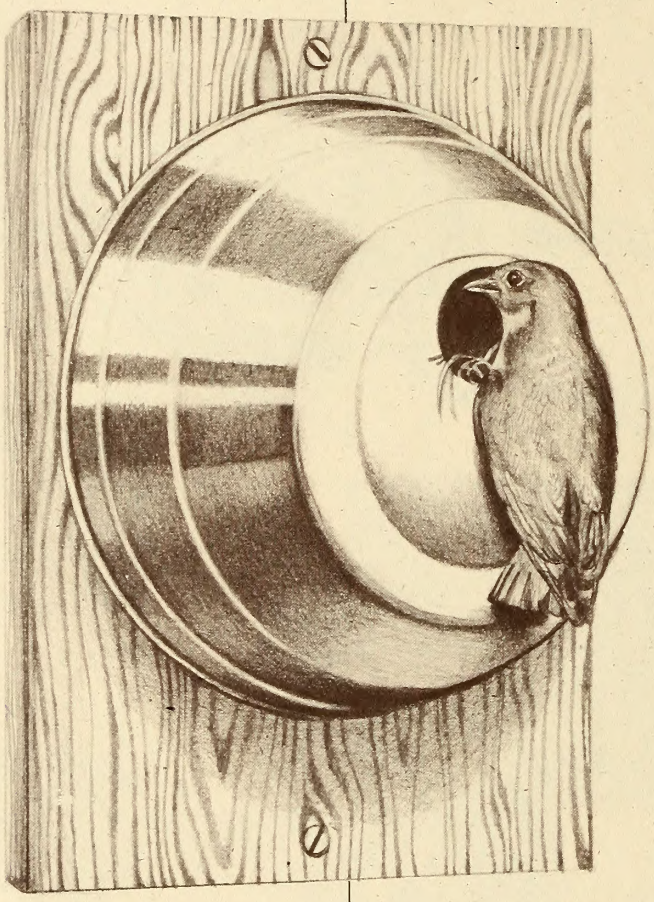
RUSTIC LOG HOUSE

A short section of log makes a picturesque rustic bird house. Split a piece off the back, and use drills and chisels to hollow out a large cavity approximately 6 inches deep and 4 inches in diameter. Cut or drill an entrance hole no larger than 1½ inches in diameter near the top of the cavity, and attach house to a backboard. Hinge the top for easy cleaning.

Canary seeds

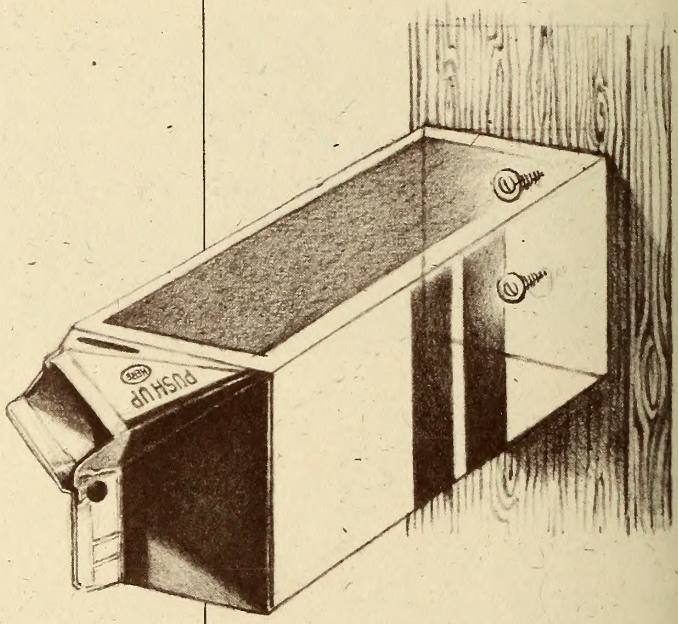


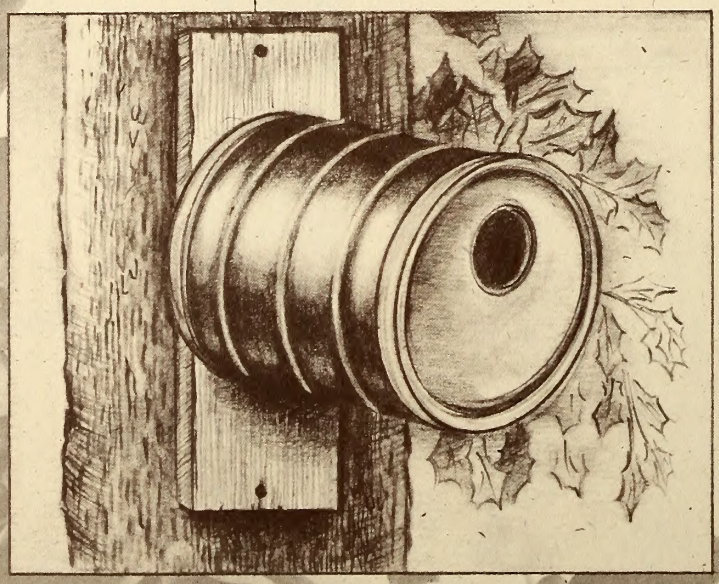
HOUSES



MARGARINE TUB MANSION

Attach the tub's lid to the backboard with staples or nails, and set aside. Then, using a 50-cent piece as a pattern, trace and cut an entrance hole through the bottom of the tub. A 50-cent piece is about 1½ inches in diameter, the ideal size for an entrance. Be careful not to make the entrance any larger, or the mansion may be taken over by nuisance birds such as starlings. Snap the tub into its cover, and mount.





MILK CARTON CABIN

Take a half-gallon milk carton, and open its top completely. Clean thoroughly. Poke two small holes through the bottom of the carton, and mark their positions on the backboard. Drill two small holes in the backboard, and attach the carton to the backboard with wood screws and washers. Close the top of the carton halfway with brass clasps as shown.

COFFEE CAN COTTAGE

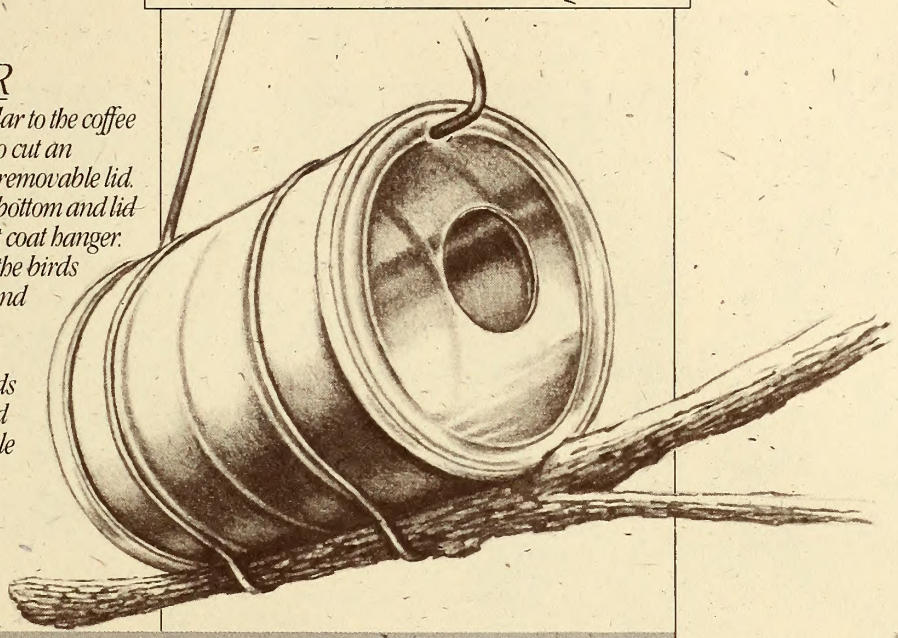
Remove the plastic cover, and use a 50-cent piece to mark an entrance, then cut out as shown. Punch a hole through the bottom of the can, and secure it to the backboard with a single wood screw and washer.

American

COFFEE CAN FEEDER

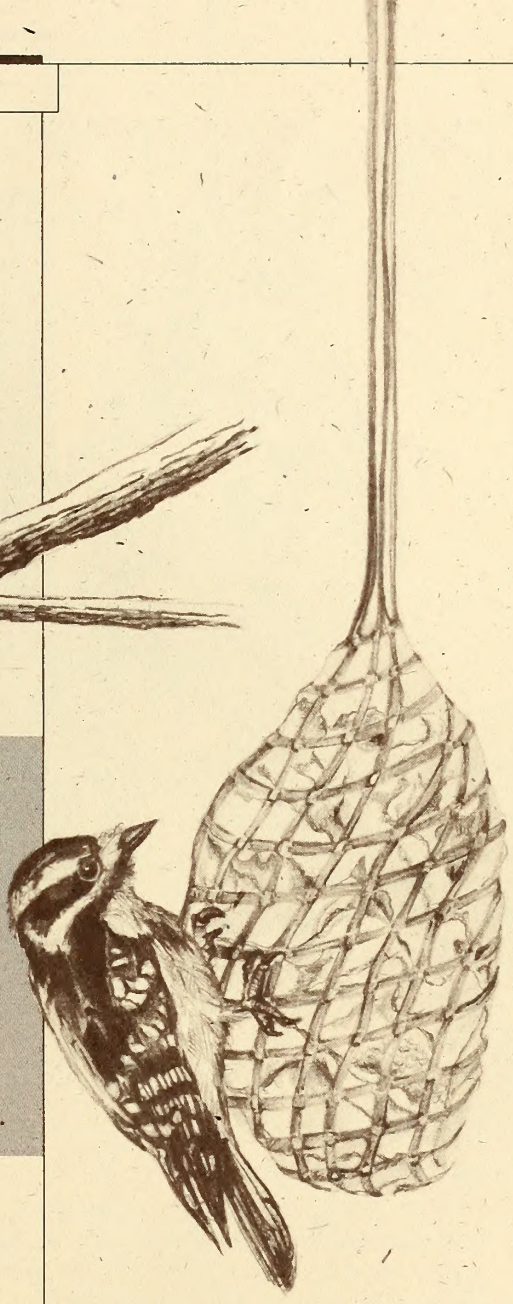
The coffee can feeder is very similar to the coffee can cottage. Use a 50-cent piece to cut an entrance hole in the center of the removable lid. Poke two small holes through the bottom and lid of the can, and hang from a bent coat hanger. Wire a perch to the bottom until the birds become accustomed to feeding, and then remove it.

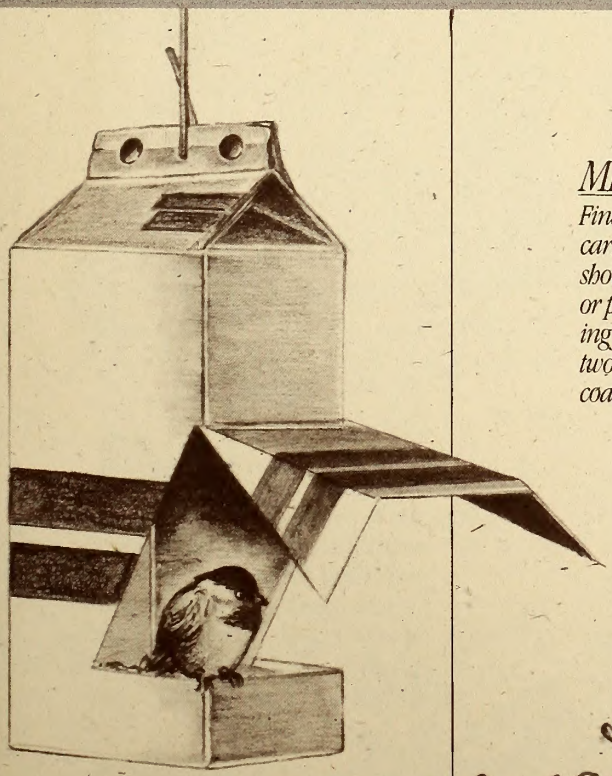
This is a great feeder if you're having problems with larger birds hogging all the feed. Grackles and blue jays, for example, are unable to use the small entrance hole.



EMPTY COFFEE cans, milk cartons, and plastic tubs make excellent bird houses and feeders. These feeders and houses were designed by the National Wildlife Federation, and make great craft projects for children.

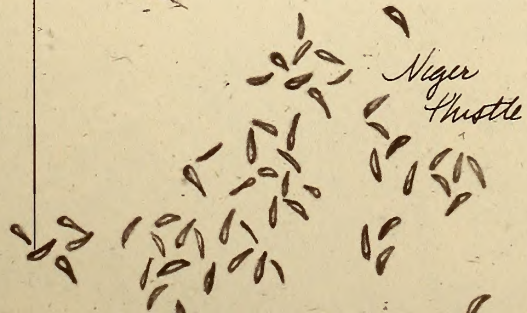
All of these houses are suitable for small songbirds, including bluebirds. However, these houses should be placed only in the shade. In direct sunlight they may overheat, which can destroy eggs and kill young birds. Be sure to poke several small holes in protected areas of each house to provide drainage and ventilation.





MILK CARTON FEEDER

Find a quart or half-gallon milk carton, and cut the entrance flap as shown. Use a straightened paper clip or piece of wire to hold the overhanging flap open. Secure the top with two brass clasps, and hang from a coat hanger.



MESH FEEDER FOR SUET

An old onion sack hung along the trunk of a tree makes a great suet holder for woodpeckers, flickers, nuthatches and other insect-eating birds.

SUET PUDDING

Suet may be purchased in a grocery store, or a suet pudding may be made at home. Suet pudding can be made in large batches, and the excess may be frozen. Thaw and use as needed.

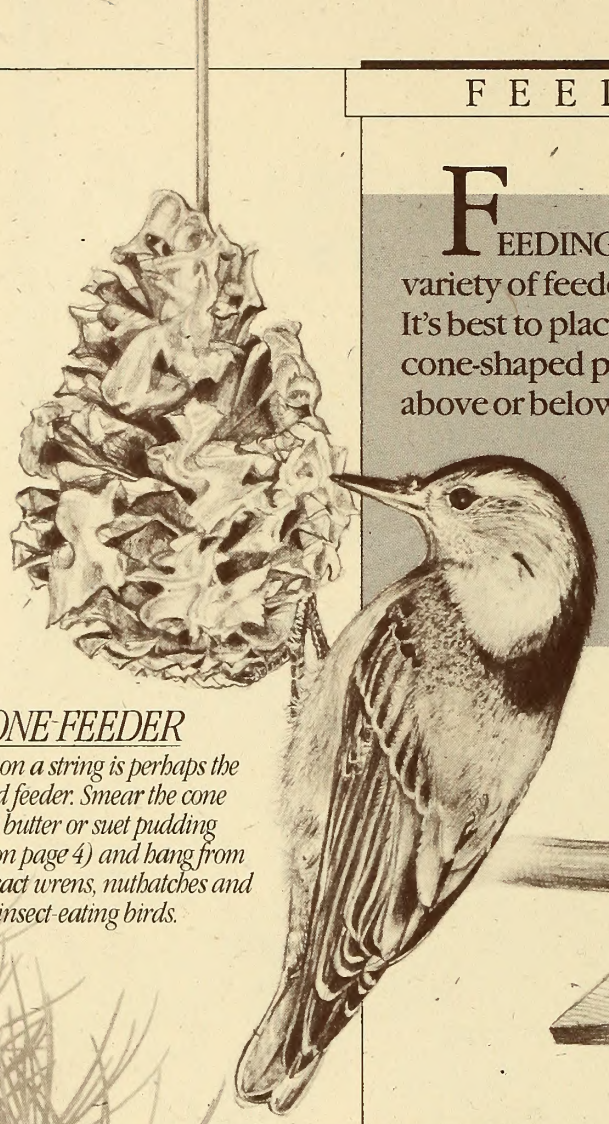
- 1 part peanut butter
- 1 part precooked cereal (oatmeal, cream of wheat, or cornmeal mush)
- 1 part suet

Heat until suet and peanut butter melt and mixture can be stirred together. Harden in refrigerator in a clean coffee can.

FEEDERS

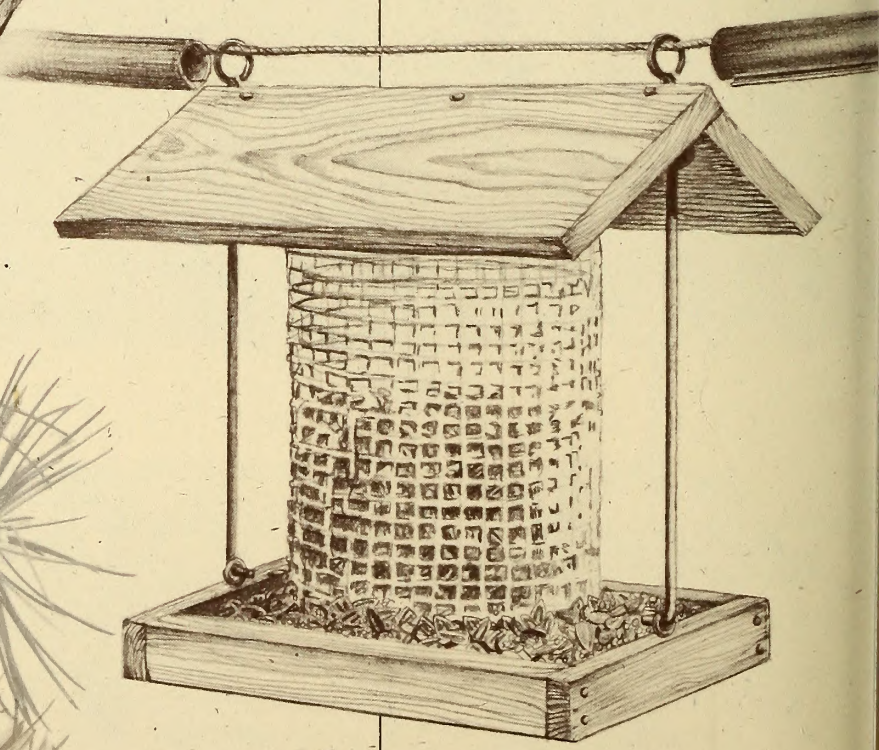
FEEDING BIRDS is a wonderful way to enjoy them, and the variety of feeders that may be made at home is almost endless. It's best to place feeders near natural cover. Attaching a small, cone-shaped predator guard made of a small piece of sheet metal above or below feeders will help foil cats and sometimes squirrels.

Once you begin a feeding program, be sure to continue through early spring. Many birds spend the winter near feeders instead of migrating south, and are dependent upon regular feeding for survival.



PINE CONE FEEDER

A pine cone on a string is perhaps the simplest bird feeder. Smear the cone with peanut butter or suet pudding (see recipe on page 4) and hang from a tree to attract wrens, nuthatches and other small insect-eating birds.



TROLLEY FEEDER

Trolley feeders are suspended from a wire between two objects, and slide within reach for easy filling. Dimensions are unimportant, but the wire cone should be made of ¼-inch mesh hardware cloth. Placing short lengths (2-3 feet) of garden hose on the wire on either side of the feeder will help foil squirrels.

FAVORITE BIRD FOODS

SUET–*blue jay, woodpecker, red and white breasted nuthatch, wren, tufted titmouse, chickadee, golden and ruby crowned kinglet, starling, grackle, flicker, brown creeper, redwinged blackbird.*

SUNFLOWER SEEDS–*chickadee, purple finch, blue jay, grackle, tufted titmouse, nuthatch, cardinal, goldfinch, grosbeak, crossbill.*

BREAD CRUSTS, DOUGHNUTS–*purple finch, junco, sparrow, brown thrasher, catbird, blue jay, tufted titmouse, Carolina wren, cardinal, chickadee.*

SMALL MIXED SEEDS (hemp, millet, rape, canary seed, chick feed, cracked corn)–*cowbird, grackle, redwing blackbird, brown thrasher, hermit thrush, house finch, catbird, snow bunting, horned lark, cardinal, pine siskin, pine grosbeak, goldfinch, purple finch, sparrow, junco.*

LARGE SEEDS (sunflower, wheat, oats, corn, millet, rye, buckwheat, soybean)–*quail, mourning dove, ruffed grouse.*

PEANUT BUTTER, NUTMEATS–*grosbeak, nuthatch, woodpecker, chickadee, blue jay, tufted titmouse, finch, cardinal, catbird, sparrow.*

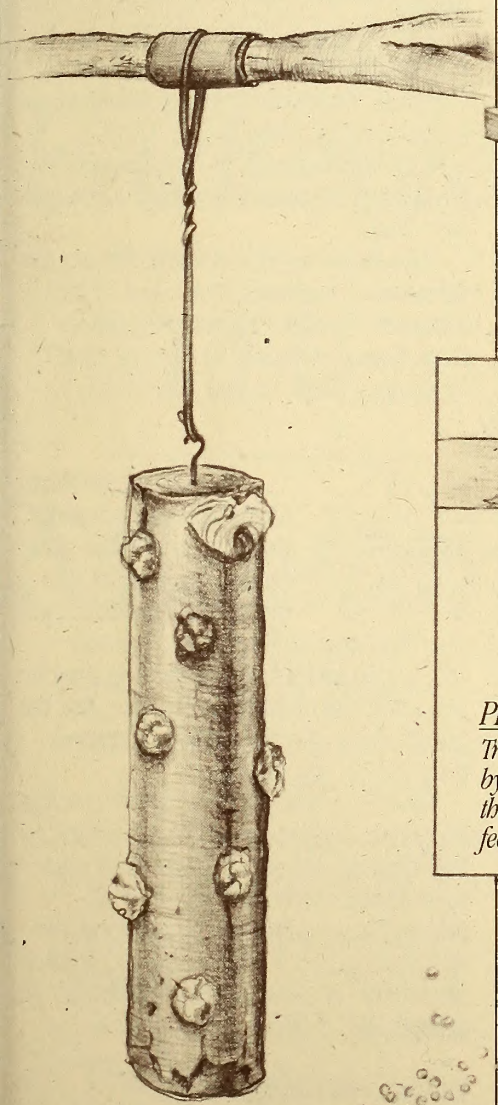
FRUIT (chopped apple, banana, raisins)–*thrasher, robin, myrtle warbler, hermit thrush, catbird, bluebird, woodpecker, mockingbird, cedar waxwing.*

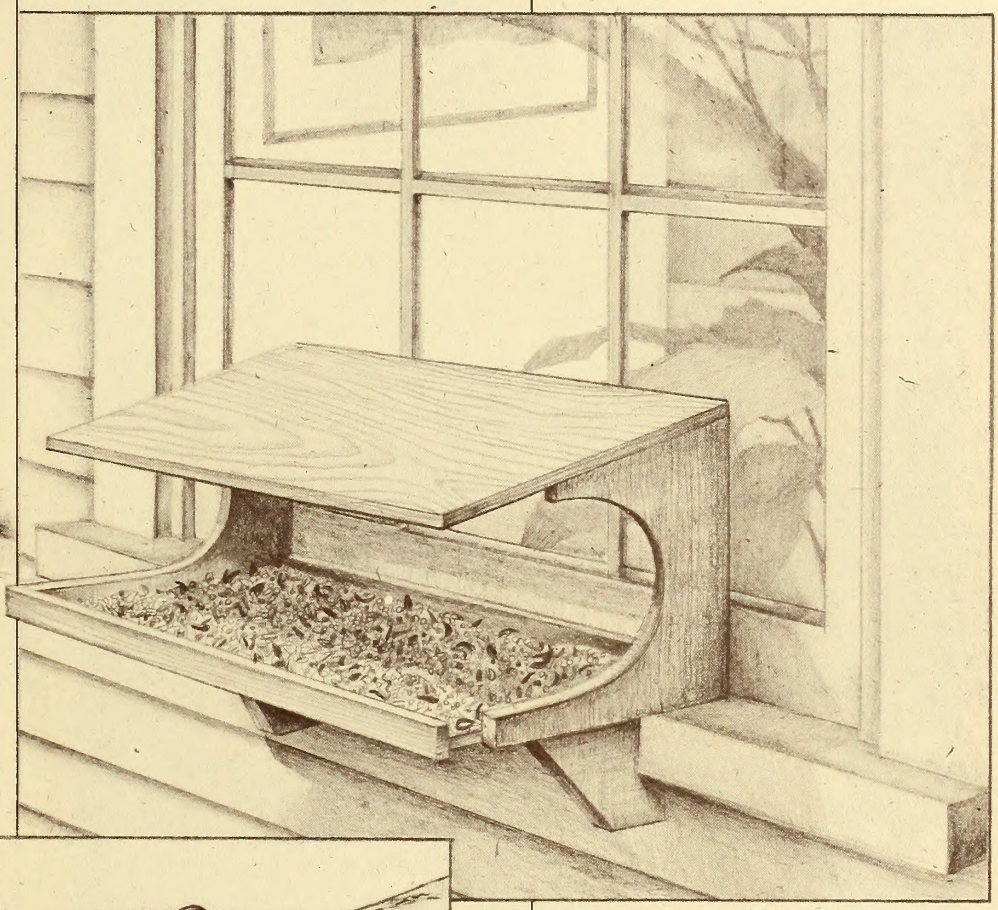
Cedar

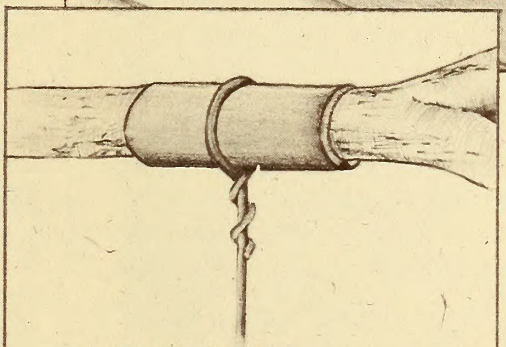
FEEDERS

SUET LOG

A suet log hung from a limb attracts woodpeckers, flickers, nuthatches and wrens. Take a short length of firewood (approximately 2 feet long and 3 to 4 inches in diameter) and drill or chisel shallow holes into or through it (about 1 inch in diameter and 2 inches deep). The exact size and spacing of the holes is unimportant. Perches aren't needed, but leave the bark on the log so that the birds can grip it while climbing. Put a screw eye in one end of the log, and hang from tree. Pack holes with suet or suet pudding.







PROTECT YOUR TREE

Tree limbs may be protected from damage by wrapping a thin piece of foam around the limb before hanging bird houses or feeders.

WINDOW FEEDER

A window sill feeder may be made of boards or plywood. Length and width vary depending on the size of the window and materials on hand. A feeder 10 inches wide with a 12-inch roof works well, and the gap in front allows for easy cleaning.

Nandina

Red proso millet

White proso millet

RESOURCES

IMPROVING HABITAT FOR BIRDS

Landscaping your yard is an excellent way to attract more birds. Trees and shrubs offer cover and two sources of food to birds–the seeds, berries and fruits produced by the plants, and the insects attracted to the vegetation.

The most attractive habitat has a mix of trees, shrubs and grasses. Evergreen and deciduous trees and shrubs offer shelter and cover year-round. It's also important to have a source of water nearby such as a bird bath or backyard pool. Even a small pool below a rainspout can be freshened regularly with a hose.

The following trees and shrubs will attract a wide variety of birds. Check with a nursery or horticulturalist for cultural techniques and suitability to your area.

Grasses, Flowers, Ground Covers

Millets
Sunflowers

Shrubs

Beautyberry
Blueberry
Blackberry
Smooth sumac
Elderberries
Pokeberries
Honeysuckle
Pyracantha
Nandina

Small Trees

Cherries
Crabapples
Dogwood
Hawthorns
Hollies
Mulberry
Plums
Serviceberry

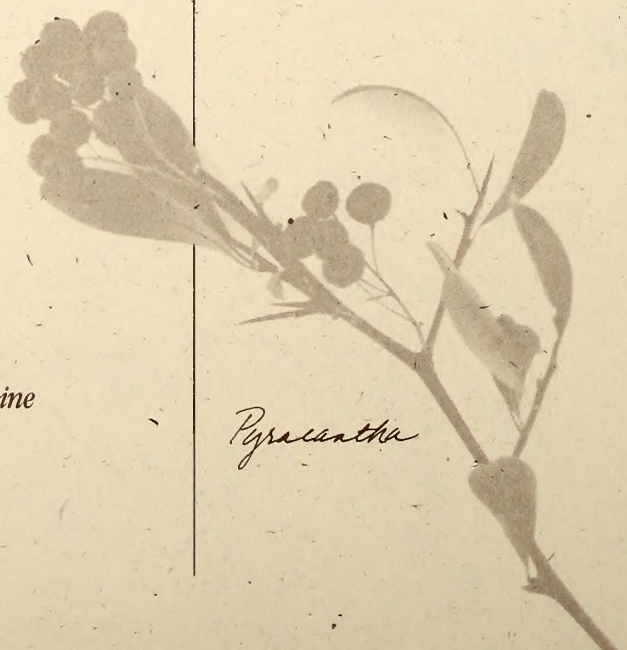
Large Trees

Hackberry
Oaks
Pecans
Tulip poplar
Magnolia
Loblolly or longleaf pine
Carolina Hemlock
Eastern red cedar

BUILDING TIPS

Expensive power tools or an elaborate shop aren't needed to build bird houses and feeders. A few basic hand tools–such as a hammer, saw, screwdriver, chisel, and a hand or electric-powered drill–are fine. Here are some hints on construction.

- Treated lumber may produce fumes that are harmful to birds. Don't use it for bird houses. Common lumber, such as pine and spruce or fir, is fine for bird houses and feeders. More rot resistant wood, such as cypress, cedar and redwood, also works very well, but is harder to find and more expensive. Exterior plywood may also be used, but must be painted and is more difficult to work with.
- Remember that lumber sizes are larger than their true dimensions. Because of shrinkage, one-inch boards are really only ¾-inch thick, and a 6-inch board is only about 5¼ inches wide (take a tape measure to the lumberyard).
- Bird houses may be treated on the outside with a latex-based paint or stain. Keep the inside natural, however. Feeders may be painted or varnished. Do not treat a house or feeder with creosote because it is toxic.
- Screws or nails may be used as fasteners. Screws are more permanent, although a little more trouble. If you're building houses and feeders as a craft project with children, pre-drill the nail or screw holes.
- Perches should not be put on bird houses. They will only attract nuisance birds such as starlings and house sparrows.



INFORMATION

Invite Wildlife To Your Backyard and *Birdwatching With Roger Tory Peterson* (brochures). Single copies available free from the Division of Conservation Education, N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27611.

Backyard Wildlife Habitat Program. Information available from the National Wildlife Federation, Dept. MO, 1400 16th St. N.W., Washington, D.C. 20036.

Books

The Complete Book of Birdhouse Construction for Woodworkers by Scott Campbell. Published by Dover Publications, 31 East 2nd. St., Mineola, N.Y. 11501.

A Complete Guide to Bird Feeding by J.V. Dennis. Published by Alfred A. Knopf, New York.

Woodworking For Wildlife-Homes for Birds and Mammals. Published by the Nongame Wildlife Program, Minnesota Department of Natural Resources, Box 7, Centennial Bldg., St. Paul, MN 55155.

NONGAME & ENDANGERED WILDLIFE FUND

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Illustrated and designed by
Ginny Brown and Nancy Gorgas

Art direction by Donnan Robbins

Written and edited by Mark Taylor

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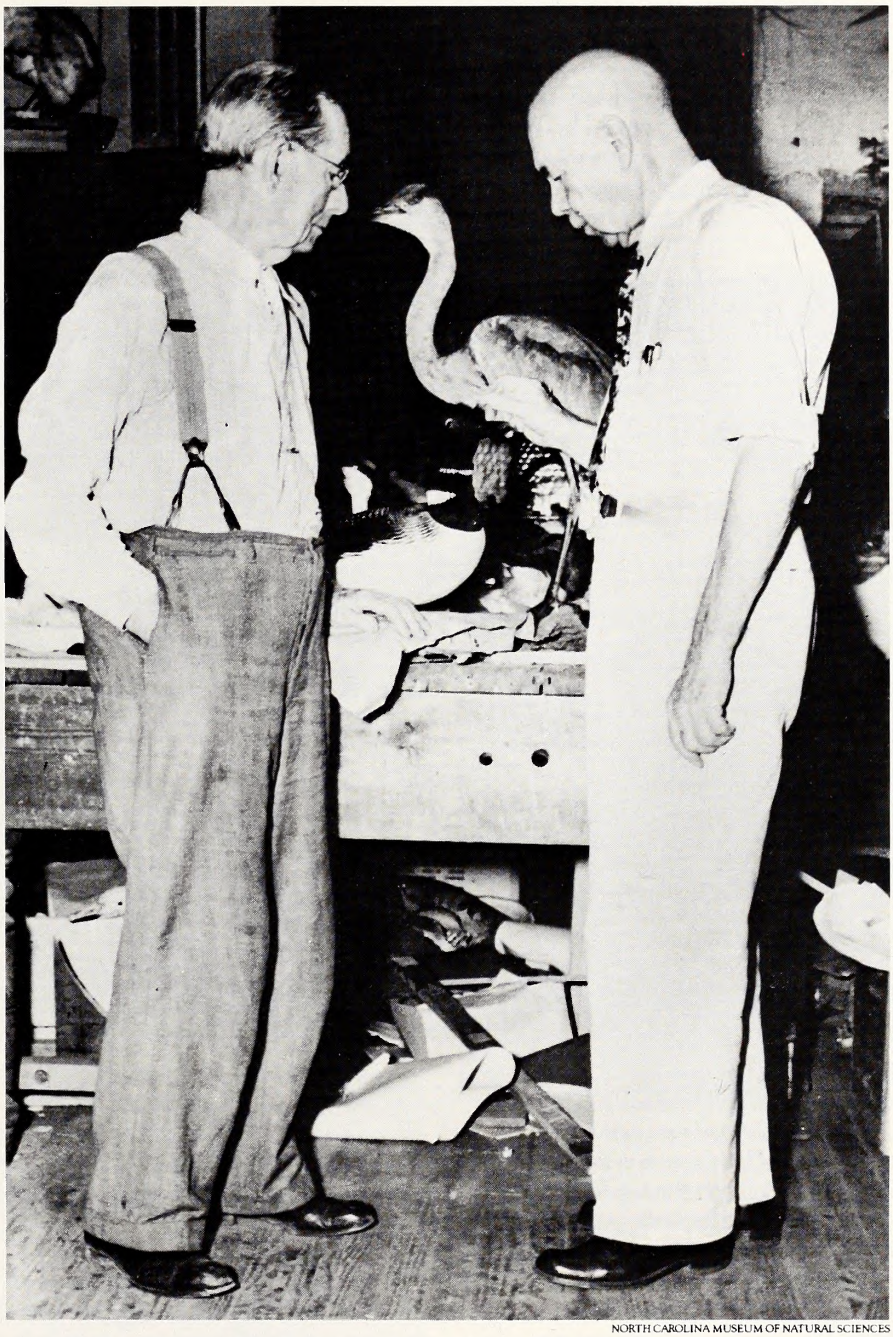
THE Brothers WHO Fathered THE Museum

H.H. and C.S. Brimley immigrated to Raleigh in 1870 from England looking for farmland, but it was their inexhaustible interest in the natural world that left a lasting mark on North Carolina. The State Museum of Natural Sciences is the most visible record of their achievements.

by Mark Taylor



NORTH CAROLINA MUSEUM OF NATURAL SCIENCES

***C.S. (left) and H.H.** Brimley discuss a mount in the museum shop in 1894.*

The dusty jumble of massive vertebrae, ribs and bones that covered the floor of the old Raleigh hotel must have been an imposing sight to the young man who first surveyed them one day in 1893. Newly hired by the N.C. Department of Agriculture as a "fertilizer inspector," he nevertheless bent to his task. Using carpenters' and blacksmiths' tools, he painstakingly measured, bored and joined the pieces together with hidden carriage bolts and hand-forged straps of iron. Three months later, the dusty pile of bones had been transformed into a complete skeleton, 46 feet long, of a right whale, one of the few in existence.

The skeleton still hangs today in the lobby of the N.C. State Museum of Natural Sciences, and the man who put it together was a young Englishman named Herbert Hutchinson Brimley, or "H.H." as he preferred to be known. He and his younger brother, Clement Samuel or "C.S." Brimley,

NORTH CAROLINA MUSEUM OF NATURAL SCIENCES

T. Gilbert Pearson *an early leader of the National Audubon Society, was a close friend and associate of the Brimley brothers. Here, Pearson (left) and his wife Elsie Weatherly Pearson enjoy a day afield with H.H. and wife Pal in the 1930s.*

WILLIAM CRAVEN

C.S. Brimley *(left) was an avid entomologist and ornithologist, and was a founder and first president of the Carolina Bird Club. On this 1942 field trip to Yates Pond in Raleigh he was accompanied by Roxie Laybourne, now a world authority on the structure of bird feathers, and John Grey Jr. a Presbyterian minister in Raleigh.*

NORTH CAROLINA MUSEUM OF NATURAL SCIENCES

H.H. Brimley and *his wife Bessie Love Brimley, or "Pal," both loved to fish. This fine catch of a striper and largemouth bass was taken from the New River in Onslow County, probably in the 1920s or early '30s.*

were perhaps North Carolina's finest naturalists. They were skilled field biologists and collectors, superb taxidermists, helped found the Carolina Bird Club and other conservation organizations, and left as their legacy our State Museum of Natural Sciences.

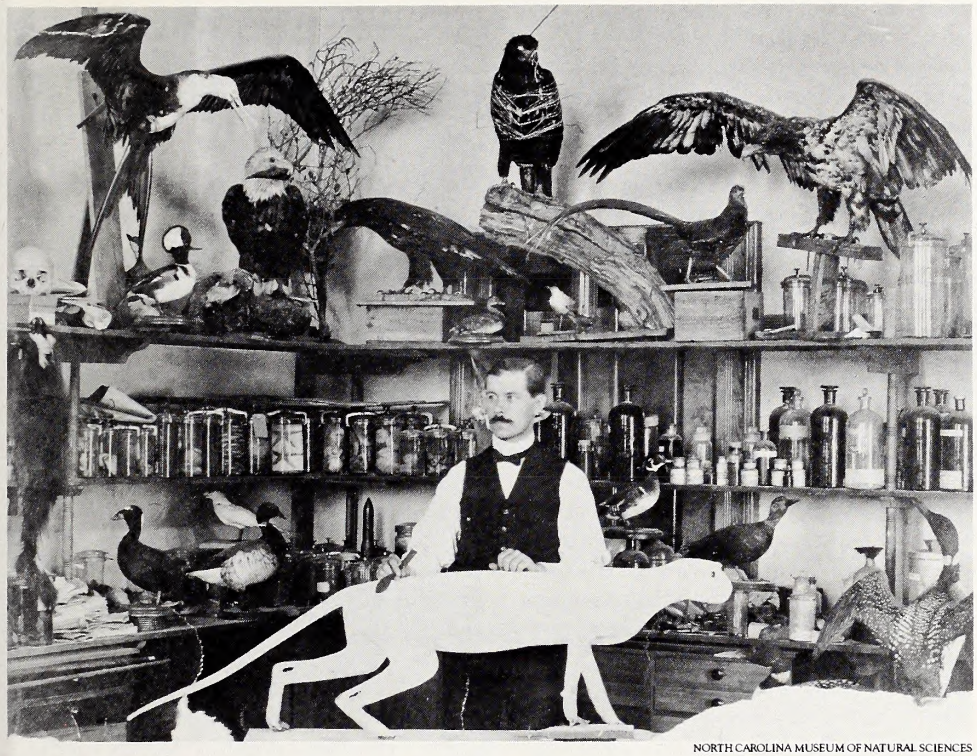
The story of the Brimleys in North Carolina begins in 1880 when the two young men imigrated here from Bedfordshire, England. They were accompanied by their parents, two sisters, and another brother. The Brimleys were farmers, but in the late 1870s crop prices in Britain had reached record lows. When an immigration agent from North Carolina visited their village and told of the bountiful crops and sunny weather of the South, they promptly decided to leave.

Ironically, the family arrived in Raleigh on the night of December 31, and spent the night at the National Hotel on Edenton Street — the future site of the museum. Ice and snow covered the streets, and their room was so cold that they wrapped themselves in a rug to stay warm. They awoke to find that a pitcher of water left on a washstand had frozen solid. Out the window they could see pigs and cattle roaming the dirt streets of the capital. However, H.H. noted later that "there was a restless, pulsing air about the place and its people that impressed me."

Earning a living, however, proved as difficult as it had in England. H.H. was two years older than C.S., and at 19 he tried farming in the Method area between Cary and Raleigh. The soil was poor, and he soon gave up to teach in a one-room school near the present site of Meredith College. The students couldn't understand his English accent, however, and he had problems with their drawl. At the end of the term, he resigned.

Fortunately, the brothers had a hobby to keep them busy. Both were avid students of natural history, and had earned pocket money in their boyhood by collecting and selling bird eggs and other natural history specimens. Armed with ropes and climbing irons, they turned their attentions to the deep woods and swamps surrounding Raleigh.

The result was a thriving small business. *Brimley Brothers, Collectors and Preparers* was founded, H.H. later wrote, to "keep the justly celebrated wolf from the not too securely fastened door." Both brothers were skilled collectors, and H.H. became an excellent taxidermist. In 1884, he was hired by the State Department of Agriculture to mount a series of waterfowl and fish from Currituck Sound for display at the State Centennial Exposition. Other commissions

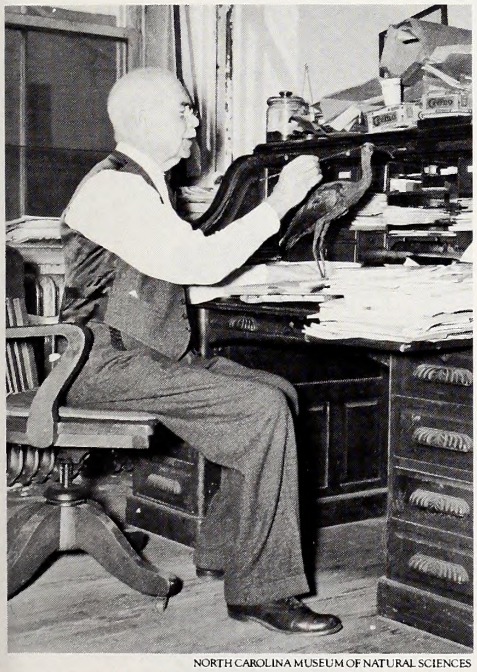


NORTH CAROLINA MUSEUM OF NATURAL SCIENCES

Both of the Brimleys *were skilled taxidermists, but H.H. (left) was a master at developing exhibits. He was also a leader in depicting animals in their natural habitats. Here, he is shown working in the taxidermy shop of the state museum as a young man, probably around 1890.*

NORTH CAROLINA MUSEUM OF NATURAL SCIENCES

Hunting was *was one of H.H.'s favorite pastimes, and he bagged this raccoon from the coastal swamps surrounding the Onslow Club. He was also an avid deer hunter, and wrote many articles about hunting and fishing for outdoor magazines and newspapers.*



NORTH CAROLINA MUSEUM OF NATURAL SCIENCES

A glossy ibis *mount (left) receives the finishing touches from H.H. in 1942. Although in his 80s, he continued to develop large exhibits for the museum.*

followed, and in 1893 he prepared a large North Carolina exhibit for the World Columbian Exposition in Chicago. This culminated in H.H. Brimley being hired by the Department of Agriculture as the first full-time curator of the state museum — with the temporary title of "fertilizer inspector" until the position became permanent.

A state museum of sorts, consisting mostly of a few cabinets of rocks and minerals, had existed in Raleigh since the 1850s. It was first housed in a room over a Fayetteville Street saloon, and later in the Department of Agriculture offices on the second floor of the Briggs Hardware Building, which still stands.

Brimley inherited these cabinets, an abandoned building — the erstwhile National Hotel — and the jumble of whale bones for his museum. Completing the reconstruction of the whale skeleton was the first step Brimley took in transforming an assortment of odds and ends into a real museum.

"This was the age of expositions, and H.H. was a master at developing displays," said John Funderburg, director of the State Museum of Natural Sciences. "He used the Columbian Exposition display, for example, to form the heart of the new museum. He was also an early master at depicting animals in natural settings."

During this period, C.S. continued to run the collecting business with the part-time help of his brother. He also began collecting insects with State Entomologist Franklin Sherman Jr. about 1900, and in 1918 he accepted a position with the Department of Agriculture working on the state insect survey. The completed survey, *Insects of North Carolina*, was not published until 1938. It lists nearly 10,000 species of insects, and reflects almost 40 years of field work.

H.H. Brimley was heavily involved in the fight for wildlife protection in the early 1900s. In 1903, he teamed up with his close friend, T. Gilbert Pearson, an early leader of the National Audubon Society, to pass the Audubon law in North Carolina. This legislation provided protection to songbirds and shorebirds, and established a system of county Audubon wardens who were charged with protecting wildlife. They were especially effective in protecting shorebirds from "plume hunters," who sold the bird's delicate feathers to manufacturers of women's hats.

It says much about H.H. Brimley's character that he and Pearson were friends — for Pearson had once tried to steal his job. This occurred in 1896, when Pearson had fin-

ished his undergraduate degree at Guilford College in Greensboro and failed to find work to finance his graduate study. Coincidentally, the Republicans had captured the governor's mansion that fall. Like most Quakers of that time, Pearson was a Republican, and he used his Quaker connections at Guilford College to arrange a meeting with the Governor. At the meeting, he asked the Governor for Brimley's job. He got it, and both men waited while the news was taken to the Department of Agriculture.

A few minutes later, Joseph Holmes, the State Geologist for the Department of Agriculture, entered. "What have you got against Mr. Brimley, and why are you trying to take his position?" he asked.

Pearson replied that he had nothing against Brimley, and Holmes ascertained that all Pearson really wanted was a means to continue his studies. Holmes offered Pearson a job collecting birds for the Department of Agriculture, which he took.

Much of Pearson's bird work was done on the coast, and later appeared in a book he wrote with H.H. and C.S. Brimley entitled *Birds of North Carolina*. The first edition of the book was completed in 1914, but all of the copies were destroyed in a fire at the printer before distribution. Most of the artwork had to be replaced, and the book was not reprinted until 1919. Second and third editions followed, and the book is still an excellent reference.

Both brothers also spent much time afield during this period — C.S. collecting his insects, amphibians, and reptiles, and H.H. on extended trips to the coast.

"C.S. did most of his collecting and scientific work close to home," recalled David Wray of Raleigh, a retired entomologist with the Department of Agriculture who worked with the Brimleys for many years. "He'd tie his insect net to his bicycle, ride out New Bern Avenue to the edge of Raleigh, and walk down into the swamps. In fact, he collected most of his specimens in the lowlands of Walnut, Swift and Crabtree creeks. H.H. preferred to take long camping trips to the coast because he was more interested in marine life, sea birds and waterfowl. Both were a joy to be with, and one of their real strengths as a team was that they had complementary, but not overlapping, interests and talents."

H.H. was also an avid hunter and fisherman, and he especially enjoyed deer and bear hunting in the swamps of Onslow County and surf fishing at the New River Inlet. His favorite companions were his wife, Bessie Love Brimley or "Pal," and T. Gilbert Pearson. Much of their fishing was done from the "Flapper," a 14-foot, canvas-covered canoe that he had built himself. He often wrote articles for outdoor magazines and newspapers about his hunting and fishing trips with "Pal" and "Flapper." These stories later appeared in a collection of his writings, *A North Carolina Naturalist — H.H. Brimley*, published by The University of North Carolina Press after his death.

In 1928, when H.H. was 67, he under-

NORTH CAROLINA MUSEUM OF NATURAL SCIENCES

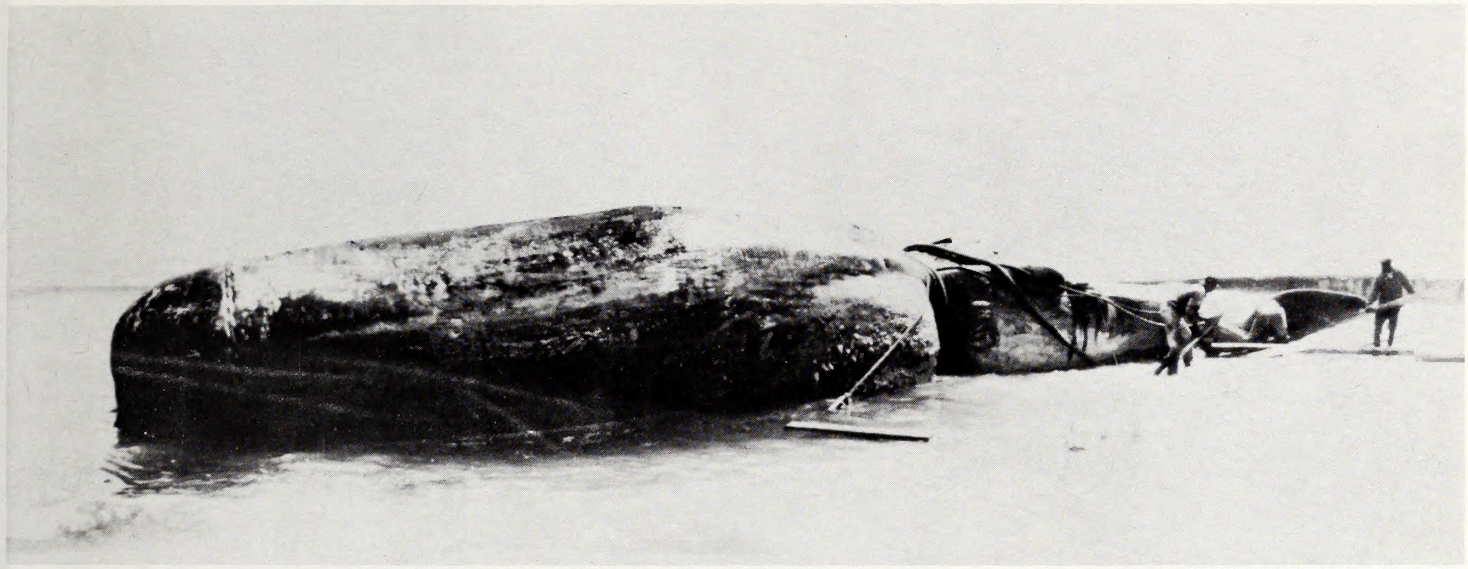
***The North Carolina** Museum of Natural History, shown here in 1890, was housed in the old National Hotel. This building was torn down in 1922, and the building which presently houses the museum was completed on the same site in 1925.*

NORTH CAROLINA MUSEUM OF NATURAL SCIENCES

***C.S. Brimley** began working on the state insect survey in the early 1900s. The completed survey,* Insects of North Carolina, *was not published until 1938 and lists nearly 10,000 species.*

NORTH CAROLINA MUSEUM OF NATURAL SCIENCES

***An insect net** and a bicycle were all that C.S. (below) needed for his field work. Most of his collecting was done along the bottoms of Swift and Walnut creeks on the outskirts of Raleigh.*



NORTH CAROLINA MUSEUM OF NATURAL SCIENCES

NORTH CAROLINA MUSEUM OF NATURAL SCIENCES

***This 54-foot** sperm whale (above) drifted ashore at Wrightsville Beach in 1928, and was quickly nicknamed "Trouble" by area residents. No one knew what to do with the whale until H.H. Brimley and Harry Davis decided to procure its skeleton for the museum. David hired a crew of laborers (below) to dismember and bury the whale. Later, the bones were dug up and transported to Raleigh where they were reassembled by Davis and Brimley.*

took one of his biggest jobs. A dead, 54-foot sperm whale, quickly named "Trouble" by locals, had drifted ashore at Wrightsville Beach. He and Harry Davis, assistant director of the museum, wished to have the skeleton for the museum. Davis and Brimley first arranged for the whale to be towed to a deserted stretch of beach, where Davis supervised its dismemberment. The bones were then buried in a shallow grave on the beach so the flesh would rot, and six months later were dug up and transported to the museum. Brimley noted that the bones still smelled like a "fertilizer factory that had been turned into a home for unexpurgated skunks," and had them reburied at the State Fairgrounds. They remained there until the winter of 1929 when they were brought to the museum. Working under Brimley's tutelage, Davis assembled the 54-foot skeleton in less than six weeks.

Davis replaced H.H. Brimley as director of the museum in 1937, but H.H. continued to work as the museum's curator of zoology. His age didn't prevent him from tackling large displays, and in his 70s and 80s he completed mounts and models of a 594-pound marlin, 1,200 pound ocean sunfish, and 17-foot beaked whale and fetus.

C.S. also continued collecting and writing in his later years, and in 1938 was given an honorary doctorate from the University of North Carolina in recognition of his contributions to natural science. Although he had only about eight years of formal schooling, he had written nearly 200 popular and scientific articles on birds, insects, reptiles and amphibians.

In their later years, the Brimleys also became the center for a small community of naturalists. They gave freely of their time and knowledge, and were especially interested in young people.

"C.S. and H.H. always had time to talk to young people about natural history, regardless of how busy they were," said Wray. "A youngster who walked into the museum with a dead bird was given the same attention as a famous ornithologist."

Both men were involved in the formation of the Carolina Bird Club, and in 1937 C.S. was elected as its first president. In addition to helping organize the club, he led many of its field trips. One of the young members he influenced was Dr. Tom Quay of Raleigh, now a retired professor of ornithology at N.C. State University.

"I took quite a few field trips with C.S. between 1937 and 1942, when I left for the War," he said. "C.S. was a fantastic naturalist and taxonomist, and could identify thousands of insects by their Latin names. He was just as good with birds in spite of the fact that he was color blind and also blind in one eye. He taught us to identify birds by their markings and behavior, and he used a telescope and his good eye to observe them. Most of our trips were local, but we took one trip to the new Pea Island National Wildlife Refuge near Cape Hatteras. In fact, we rode in the same truck that Eleanor Roosevelt had used when she'd been there a few months earlier. We had a great time, and C.S. was always the court of last resort when we couldn't agree on a bird."

H.H. and C.S. Brimley remained active until their deaths in 1946. H.H. died first — on March 7 at the age of 85 — and C.S. died on July 23 at the age of 82. When he died, H.H. was the oldest working state employee, and had served the museum for more than 60 years.

"The Brimley brothers were exceptional men, and they died the way they lived," said Funderburg. "They both had heart failures as they were getting ready to come to work at the museum they loved." ⊠

BIRD DOGS & BIG STAKES

For decades, the best bird dogs in the world have been tested in trials in these sandy, pine-rimmed fields near Hoffman, and the traditions are still going strong.

written and photographed by
Jane Rohling

Okay, I admit I'm one of those women who never quite grew out of the "horsey" stage that most young girls go through. So a few years ago, when a biologist from the N.C. Wildlife Resources Commission made it possible for me to ride in the field trails in the Sandhills, I jumped at the chance. Four years later, I'm still going and enjoying it just as much as the first time.

I go mainly to ride a horse, but I also enjoy seeing people I've met in previous years and I'm even beginning to enjoy watching the dogs, now that I have some idea what to look for. Horses, people, dogs—these are what draw all field trial enthusiasts, although per-

haps not in that order. Most field trialers might say I've got things exactly backwards.

The sport of field trialing traces its beginnings back to 1866, when the first recorded competition for bird dogs was held at a beautiful country estate in England. Eight years later, the first American field trial was held near Memphis, Tennessee. This initial "Grand Field Trial" for setters and pointers attracted only nine entries, but it gave birth to a sport that has flourished in the 114 years since.

In this country, field trials traditionally were held on large plantations. Over the years, these large tracts of land have been disappearing—divided into smaller farms or sold for development. In the late 1940s, North Carolina field trialers recognized this problem and turned to the N.C. Wildlife Resources Commission for help.

The Commission made an agreement with the U.S. Army to lease a large tract of land near Hoffman, known as Camp Mackall, for the development of a field trial course. Clearing of the course began in 1949, and in the early 1950s a clubhouse, horse barn and kennels were built to serve as headquarters of the Sandhills Field Trial Grounds.

The first trial was held at Hoffman in 1953. By 1961, six clubs held trials on the Sandhills grounds, and by 1966, Hoffman was host to the National Amateur Quail

***Almost all the** ingredients for a perfect field trial are here — people, horses, an English setter pointing and a beautiful late afternoon sun. Now all that's required is the appearance of a quail or two.*

Championship and the U.S. Quail Futurity Classic. The 1966-67 season brought over 1,500 trainers and spectators to the Sandhills. Today there are over 20 clubs in the N.C. Field Trial Association, and during the '88-'89 season, Hoffman will host 18 trials, in which probably 1,000 dogs will compete — bringing with them maybe three times that many owners, trainers and spectators.

One August evening in Snow Camp, I talked with a couple of long-time Hoffman field trialers. Norman and Gloria Melton started competing in field trials 16 years ago with Brittany spaniels, and they founded the Tar Heel Brittany Club.

"Field trial people are crazy," says Norman. "From mid-September through March, every single weekend, if they're not practicing they're at a field trial. There's no room for anything else."

Attending field trials is a family affair for many people. Gloria and Norman train their own dogs, and at trials Norman handles the dogs with Gloria as his scout. For years, they loaded the kids and dogs into their station wagon on weekends and headed to the nearest trial.

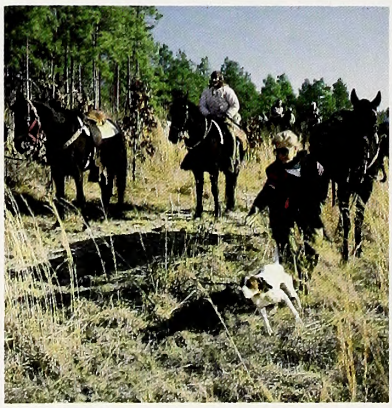
"When you've been doing it for so long, it just gets in your blood," Gloria says. These days, the Meltons travel to field trials in style—in their motor home, towing a trailer full of dogs and horses. And although they have traveled all over the eastern United States, Hoffman is still one of their favorite places.

"We can leave home in Snow Camp late Friday night, drive to Hoffman, put our horses in the barn and dogs in kennels, and sit down in the motor home for a glass of wine. The next morning, we wake up to the sounds of trucks coming in and step outside to the smell of horse manure and leather, and find good friends to say hello to. That's sorta havin' it made, isn't it?"

Those who are not familiar with the sport are probably asking, "So what are these field trials all about, anyhow?" Well, I've been trying to figure that out for four years now, and I think I've almost got it.

Field trials are competitions among bird dogs to find quail skillfully and stylishly, though that certainly oversimplifies it. And when I talk about bird dogs, I mean mainly pointers and setters. In bird dog trials, there are several types of "stakes," with different rules and judging standards for each. Mike Gaddis, a veteran field trialer, judge and frequent contributor to this magazine, explains: "Amateur stakes are limited to amateur dog handlers. Open stakes are open to anyone, but are primarily the domain of the professional trainer." However, a professionally trained dog can be run by an amateur

***A scout releases** her dog at the beginning of a brace. In a field trial, all dogs in each category compete. Finding quail and pointing with style are only two of a dog's many skills judged.*



"Field trial people are crazy. From mid-September through March, every single weekend, if they're not practicing they're at a trial. There's no room for anything else."

Tests Succeed

New management techniques at the J. Robert Gordon Field Trial Grounds, an 8,000-acre portion of the Sandhills Game Land at Hoffman, may help boost the numbers and visibility of quail for field trialers.

"Obviously you can't have a field trial if you can't see the dogs," says Harlan Hall, Piedmont supervising biologist with the Wildlife Commission, "but at the same time you can't have a trial if you don't have enough cover to hold quail on the courses." The dilemma required biologists to come up with a cover that was low growing and did not inhibit visibility. Blackberry and plum thickets, grape vines and pearl millet have filled the bill.

The sterile, droughty soils of the Sandhills, and high deer populations in the area, have always made it hard to grow such favored quail foods as soybeans, peas, corn and milo. A crop rotation at Hoffman now proving successful as a quail food is a mix of browntop and proso millet. Rye is planted in 18 months and is later overseeded with kobe and sericea lespedeza. Heavy cover is provided by patches of pearl millet and sudan-sudex grass, while switch-grass and Atlantic coastal panic grass look promising as well. Hairy vetch may also benefit quail.

To supplement the wild population of quail while the Commission staff experiments with new management techniques, the Field Trial Association has been allowed to release nearly 1,800 eight-week-old quail certified as disease free by a diagnostic lab. (Release of birds carrying poultry diseases could devastate wild populations.) They are put out in coveys of about 12 birds each in late summer, while there's still a good supply of insects and other foods available. Association members feed them once a week throughout the winter.

In addition, field trials are only held 12 days a month, and the six-hour course is only run once a day, an effort to keep the birds from literally being run off the course. The Commission has asked that the Association keep a record of when and where coveys are found during trials to help evaluate the effectiveness of its new management techniques.

handler in either amateur or open stakes.

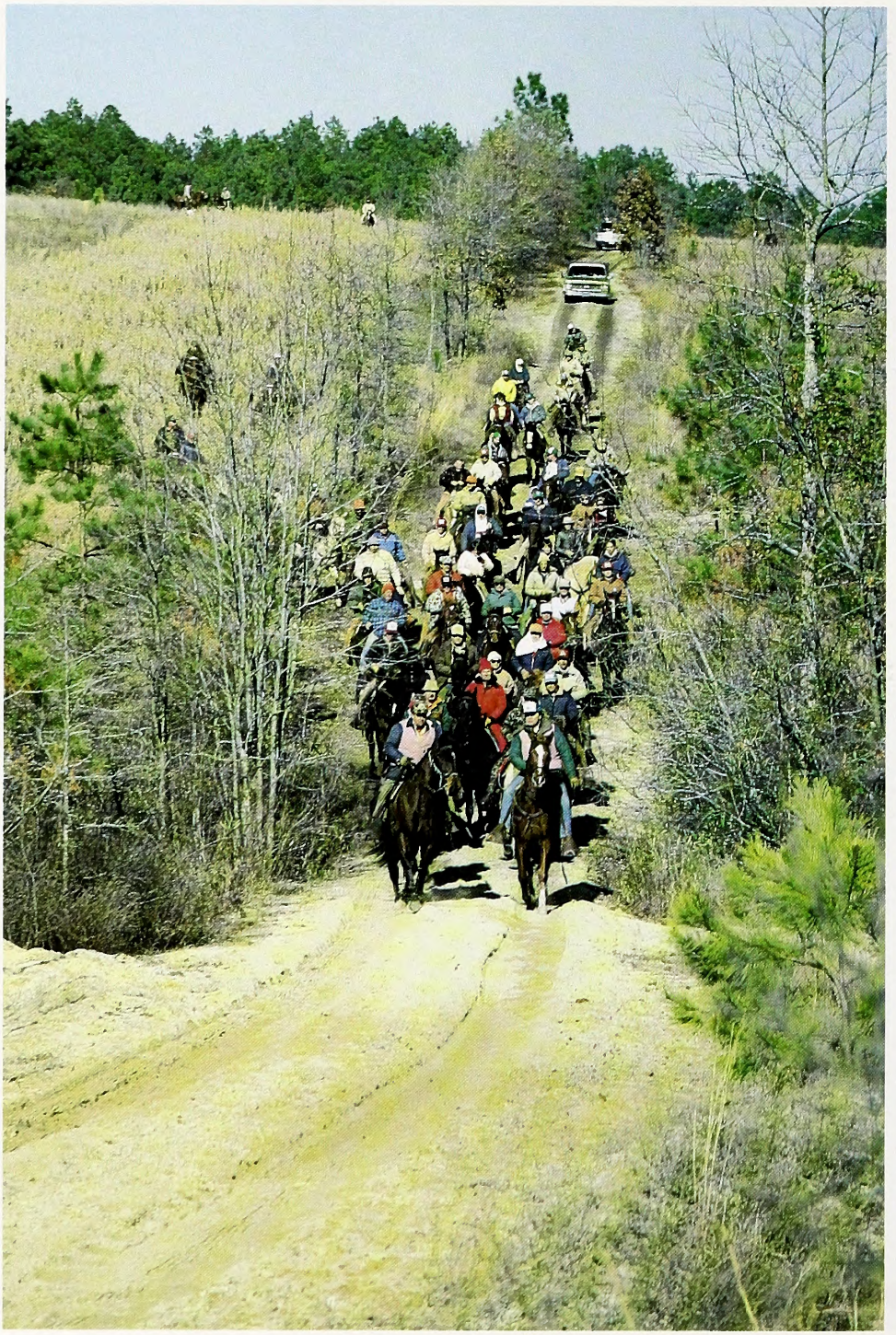
Another distinction between types of stakes is whether they are shooting dog or all-age stakes. Gaddis defines these stakes as follows: "All-age stakes take big grounds because what you're emphasizing there are the big-going dogs, dogs that run far and wide, that are highly aggressive in terms of ground coverage." (That can mean that once the dogs hit the ground the spectators never see them again until they're picked up at the end of the heat.) "All-age dogs tend to be very independent, bold, far-reaching dogs."

"The shooting dog stakes are meant to epitomize what the classic plantation shooting dog hunt from horseback was like. Shooting dogs cover a lot of ground, too, but they're generally expected to be more tractable in terms of handling." (They work closer to the handler, making it easier for spectators to see what's going on.)

All-age and shooting dog stakes are for mature dogs, generally over two years old. Clubs usually run puppy stakes for dogs under 12-18 months of age and derby stakes for dogs under 2-2½ years old.

So, within one trial, four stakes may be run as either amateur or open events. Many

In the tense *moments before the dog is released, a scout and handler lean forward with anticipation. By shouting and whistling at their dogs, handlers can communicate many kinds of information to them.*



***The best horses** to ride at a field trial are a Tennessee walking horse or a Missouri foxtrotter. These are gaited horses with a smooth, fast running-walk and the stamina to keep it up all day.*

trials, particularly amateur stakes, begin on Friday nights with a little social gathering and the drawing for braces. Only two dogs run at a time, and they are called a brace. The names of all the entries are put in a hat and drawn to determine the order in which they'll compete.

During a trial, activity at the field trial headquarters starts early. People are up feeding and watering horses and dogs by around 5:00 a.m. C.H. Burgess, who's practically a permanent fixture at Hoffman, already has hot coffee and doughnuts or biscuits ready in the clubhouse. He's out rounding up some of his rental horses for anyone who hasn't brought his or her own. Spectators are welcome at the field trials, whether they know anything about bird dogs or not. But if you don't have a walking horse or foxtrotter, I'd suggest you let Mr. Burgess fix you up with one of his "special" horses. You'll enjoy yourself a lot more.

By 7:30 or 8:00 a.m., the whole crowd's saddled up and headed for the beginning of the course. Hoffman has what's referred to as a "continuous course," with six one-hour heats. After riding the 31-mile course maybe a dozen times, I still can't find my way around it. Most of the course is essentially a 70-100 yard wide fairway, which doesn't sound like it would be too hard to follow. But the 8,000 acres of longleaf pine forests broken by fields and dotted with food and cover patches for quail all looks pretty much the same. Many field trialers who weren't totally familiar with the layout have found themselves lost for hours. The lucky ones eventually find their way back to the clubhouse. So, if you're new to the game, it's a good idea to stick close to the "gallery" (as the herd of spectators is called).

To get something out of watching a field trial, it helps if you know something about the players and the rules of the game. The two people in front of the crowd hollering and blowing whistles are the handlers of the dogs in that brace (usually the owners or trainers). Norman tells me that the whistle blowing is a signal for the dogs to "skiddat." "Whether you blow it one time, two times, three times, don't make no difference. The dog don't count 'em anyhow. The whistle just means, 'Skiddat!'

"The hollering—we call that 'singing' to the dog—is done so the dog knows where you are. It's as important for the dog to know where you are as it is for you to know where he is."

Each handler will have a "scout" to assist him or her. The scout is usually the person who releases the dog at the beginning of the brace so the handler can be on his horse and ready to go. The scout is also the person who may go flying across the course at break-

neck speed to get a dog that's strayed off course, and shoo him back up front to the handler.

The judges have a tough job. First, they've got to be able to keep track of the dogs, and that's no easy task. After watching one little red setter running through the wiregrass and broomsedge, it's pretty obvious why the preferred color for pointers and setters is predominantly white. But when you put two liver and white pointers next to each other, they can look a heck of a lot alike. At that point, it's considered good manners for one of the handlers to call for an orange collar so the judges can easily tell them apart.

Now, what are the judges looking for? The answer to that question can be somewhat subjective, but I'll try to give you a few clues.

"It should be evident from the very beginning, from the time that dog's turned loose till the time he's picked up, that he's got one thing on his mind and one thing only, and that's to find birds," according to Gaddis. "Field trial dogs are super athletes, just like Michael Jordan. They're fast. They're bold and independent. They fly. Everywhere they go they're in a hurry, but it's for a purpose. And so, when they run it ought not to be aimlessly. When you look at a dog you ought to be able to tell that he's either on an edge, which is the logical place for a bird to be, or he's headed toward an objective."

The judges are also looking at the dog's speed and style of running. "He ought to be pleasant to look at, ought to have a merry tail, he ought to command your attention and have a pleasing gait. And, of course, whenever birds are located, you expect a point."

"In shooting dog and all-age stakes you expect 'finished manners' from there on, which means that the dog points and does not move again until he's sent on by the handler. The dog should point and hold the birds, and have superb style in doing so. Normally, that means a high head and tail. A dog ought not to be fidgeting and cat-walking. He ought to be intense on those birds and stay steady. When the birds go out and the gun goes off, he stays put. Those are finished manners."

In a trial, a dog is expected to point any feathered game. That means bobwhite quail, and also woodcock, grouse, pheasant, prairie chicken, etc. Whether or not they should point wild turkey is a current point of contention (two dogs were recently disqualified in a major trial for not doing so). They should not, however, point songbirds. And they should *not* chase deer . . . which tends to be a major temptation for dogs running at Hoffman.

The decline in quail populations that has occurred over the last couple of decades has caused some problems for field trialers. Many trials now are run using pen-raised birds, so it's almost certain that some dogs will have game contact. But these liberated birds behave much differently from wild birds, and are not as challenging to hunt.

Also, the shortage of wild quail has resulted in some new judging standards for those situations when there is little or no bird work during a trial. Sometimes a mediocre dog gets lucky and stumbles across a liberated bird right out in the open (where no wild quail would be caught dead), while other dogs, which did a much better job of covering the ground didn't find any birds at all. The judges may in this case, decide to have a call-back to give the better dogs a second chance at finding game. Or, they may "place the dogs on class." That means the dog looked hard and ran a good race but did not find any quail.

At the Sandhills Field Trial Grounds, the entire course is only run once a day. In all-age and shooting dog stakes, there are usually three braces in the morning and three in the afternoon. In puppy and derby stakes, which have shorter heats, there may be twice that many braces.

By the end of a long day in the saddle, everyone's tired and anxious to get back to the clubhouse for a drink to wash the grit out of their teeth. But there's still work to be done. So, the horses have been cooled off, fed and watered, and the dogs are devouring their food long before the humans get a chance to wash half an inch of dust off their faces and sit down for a relaxing evening with good food and good friends to talk about . . . you guessed it, bird dogs.

"We miss one another in the summertime," Norman Melton said of their field trial friends. "In the summertime we haven't been around the folks to talk about the sport we love. We look forward to the first trial and we're glad to see the last one and then we can't wait until the first one again. Isn't that the way it works?" There's a warm smile on Gloria's face as she nods in agreement.

"Gloria and I know people in lots of places because of this sport. They're very fast friends that endure a very long time because of what you have in common. And this is real important. Norman Melton can be braced with the most renowned brain surgeon in the world running a couple of dogs. And we might talk to each other all day long before I find out what he does for a living. And it's not important. There's no ladder in the field trials that's based on economics or your social standing in the community. It's based on your bird dog. And all the rest doesn't really matter." ⊠

***The best field** trial dogs are pointers, like the one above, or setters. Style is an important ingredient in bird stakes. The dog should point and hold the birds with a proud carriage — a high head and tail.*

"The decline in quail populations has caused some problems for field trailers. Many trials now are run using pen-raised birds, but these liberated birds behave differently from wild birds."

Fish Bite Like Mad Just In Time

Trout Unlimited Hosts CATCH Clinic For Handicapped Youngsters

Written and Edited by Mark Taylor

Catching a fish is quite a thrill for a youngster, and that first fish is special indeed. Last summer, a group of special youngsters shared this thrill at Boone's Fork Recreation Area near Lenoir—a facility constructed especially for handicapped fishermen.

The area was built last year as a cooperative project of the U.S. Forest Service and Trout Unlimited, and Dennie Burries of the Rocky River Chapter of Trout Unlimited in Charlotte decided it would be an ideal location for a CATCH clinic for a group of handicapped youngsters. He contacted the Metrolina Independent Living Center near his home in Charlotte, and arranged for the children to be brought to the recreation area.

The Trout Unlimited volunteers gathered early at the site. As they anxiously awaited for the youths to arrive, several tested their angling skills. The trout that the Wildlife Commission had stocked earlier for the clinic refused to cooperate, and the sky began to darken. The volunteers became worried that the threatening weather would keep the youths away, and that even if they did arrive the fishing would be poor.

Soon, two vans loaded with children pulled into the parking lot. Several minutes later, they were ready to go fishing. Many of the children were in wheel chairs, but found it easy to maneuver down the ramp and onto the pier. After a brief talk about safety, it was time to wet a hook. Few of the children had fished before, and most of the volunteers had not worked with disabled persons.

The trout that had earlier refused to cooperate hit like mad once the children began fishing, and there were lots of happy yells as rods were bent. Volunteers were kept busy baiting hook, untangling lines, and keeping track of everyone's catch.

By the end of the day, all of the children had caught fish—and many went home with their limit. The volunteers, however, went home with much more.

"Everyone felt that this was one of the best projects we'd ever done," said Burries. "These youths were an inspiration to us all. They refused to let their handicaps keep them from enjoying new experiences, and brought back for us that basic childhood joy of catching your first fish."

—Kim Garner
CATCH Coordinator

GARVIN HUGHES

A Special Day: *A group of disabled youngsters from Charlotte recently participated in a CATCH clinic at the Boone's Fork Recreation Area. The facility provides fishing for the handicapped, and was built as a special project of the U.S. Forest Service and Trout Unlimited.*

Slow Cooking The Key

Venison Hash Is Deer Hunter's Treat

There are probably nearly as many recipes for cooking venison as there are deer hunters, and everyone has a favorite. However, Ed Jenkins, an avid deer hunter who works for the Wildlife Commission's Division of Enforcement in Raleigh, says that this method of slow cooking venison produces the best deer meat he's ever tasted. It's an old family recipe passed down to William Averette of Butner, and Ed says that anytime Bill cooks venison he's never lacking for friends.

William Averette's Famous Venison Hash

1 hind quarter of venison
5 large onions
1 15-ounce bottle Worcestershire sauce
1 pound of beef fat
2 cans cream of mushroom soup
2 Tb. salt
2 Tb. pepper

Debone hind quarter and place in an oven roaster. Cube beef fat and insert cubes in slits made in meat. Dice onions and sprinkle over meat. Sprinkle half bottle of Worcestershire sauce over meat, fat and onions and add one can of cream of mushroom soup. Sprinkle salt and pepper over top, cover and bake for two hours in a 200-250 degree oven. Add remaining can of soup and the rest of the Worcestershire sauce, and bake for another three hours at the same temperature. When finished cooking, hash the meat with the juices and serve.

Record Trout Is Caught On Marshmallow

The home of the new world record trout is, of all places, Arkansas.

Recently, Mike Manley of Little Rock caught a 39-inch brown weighing 38 pounds, 9-ounces in the North Fork River, which is fed by Bull Shoals lake. The river's water temperature is constant year-round, and the combination of warm air temperatures and cool water has resulted in a stream that is extraordinarily productive.

Manley caught the fish on ultralight tackle rigged with 6-pound test line. He was using corn and marshmallows for bait.

"It was quite a struggle," he said. "I smoked two cigarettes before I landed him."

Best Success In Coastal Plain

Survey Shows Quail Hunting Improved In 1988

Quail hunting improved over most of the state last year, and grouse hunting remained stable. These were the results of the 1987-88 Avid Hunter Survey, which uses hunter success to monitor trends.

Nearly 150 avid quail hunters participated in the survey, and documented their success from over 3,000 hunts. The results showed that quail hunting was best in the Coastal Plain. Hunting parties flushed an average of 3.82 coveys of quail per trip—an increase of 19.7 percent over the previous season. Piedmont hunters flushed an average of 1.97 coveys per trip, an increase of nearly five percent. In the Mountains, however, only 1.08 coveys were flushed per party per trip—a drop of about 37 percent from the previous season.

"The hunting was best in the Coastal Plain and declined steadily as you moved west," said Terry Sharpe, small-game project leader for the N.C. Wildlife Resources Commission. "Although farming practices have changed to the detriment of quail, the Coastal Plain still has more habitat for the birds than the rest of the state. Quail habitat in the Piedmont is growing scarcer as the human population grows and farming practices change. It's difficult to explain the sudden drop in the mountains. We've had several years of dry weather which could be hurting the birds, but quail populations have always been spotty in the west."

Success of grouse hunters remained fairly constant. Over 50 hunters participated in this survey, logging 950 hunting trips. Hunting partices flushed an average of 5.08 birds per trip—roughly the same as last year. The data also shows that hunters must spend an average of 10 hours afield for every grouse bagged. Over the past four years, hunter success and the number of grouse flushed per trip has varied very little.

"Grouse hunting has never been easy," said Sharpe. "The northwestern and far western counties had the highest harvest rates, but it's most important for hunters to be persistent and learn the area.

Natural Areas Guide Printed

Are you looking for an outdoor getaway? Then be sure to order a copy of the *Directory to North Carolina's Natural Areas.* Over 100 natural areas are included in the directory.

The 90-page directory was produced by the North Carolina Natural Heritage Foundation, and is now in its second printing. All proceeds benefit conservation efforts of the foundation and the N.C. Natural Heritage Program. Single copies of the directory are available for $5 (includes sales tax and postage) from the N.C. Natural Heritage Foundation, P.O. Box 11105, Raleigh, N.C. 27604. Information on discounts for bulk orders is available from the same address.

Field Notes

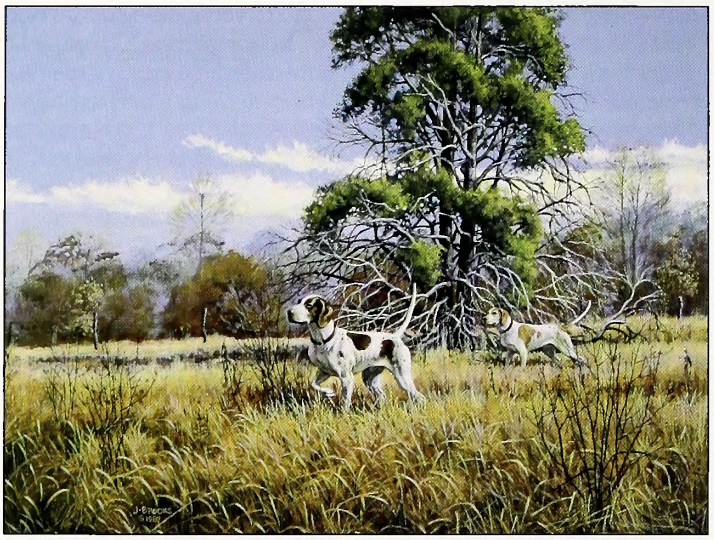
Season openings, closings, and regulation changes:

Eastern gun deer season	Open through Jan. 2
Central gun deer season	Open through Jan. 2
Northwestern gun deer season	Closes Dec. 3
Western gun deer season	Closes Dec. 10
Western bear season	Dec. 12-Jan. 2
Wild boar	Dec. 12-Jan. 2
Gray and red squirrels	Open through Jan. 31
Fox squirrel (in open countries)	Closes Dec. 31
Rabbit	Open through Feb. 28
Quail	Open through Feb. 28
Grouse	Open through Feb. 28
Western raccoon season	Open through Jan. 31
Eastern raccoon season	Open through Feb. 28
Woodcock	Open through Jan. 2
Common snipe	Open through Feb. 28
Mourning doves	Dec. 19-Jan. 7
Ducks, mergansers and coots	Dec. 15-Jan. 7
Sea ducks	Open through Jan. 14
Snow and blue geese	Open through Jan. 31
Brant	Dec. 15-Jan. 7
Swan (by permit only)	Open through Jan. 31

Information on bag limits, either-sex hunts and other regulations may be found in the *1988-89 North Carolina Inland Fishing, Hunting and Trapping Regulations Digest.* Information on waterfowl regulations is available from license agents.

Sportsmen are reminded that legal shooting hours for waterfowl run from sunrise to sunset. In the past, shooting hours opened at one-half hour before sunrise. However, webless migratory game birds (woodcock, snipe and doves) may still be hunted from one half-hour before sunrise until sunset.

The 1989 North Carolina Wildlife Calendars Are Here!



***With such artwork** as James A Brooks' "Team Mates" featured above, the N.C. Wildlife Calendar is sure to be a success!*

The works of Larry Barton, Duane Raver, Robert B. Dance, Alan Cheek, Bob Timberlake, Bob Herr, Bob Henley, James A. Brooks, Ronald J. Louque, Louis Frisino and Judy Johnson McPherson are featured in the 1989 Wildlife Calendar.

Order yours today by returning the form below with your check or money order to 1989 CALENDAR, N.C. Wildlife Resources Commission, 512 N. Salisbury Street, Raleigh, NC 27611.

ORDER TODAY!

Please send me ..... N.C. Wildlife Calendars at $6.00 each $_____

Wake County residents add $.30 sales tax per calendar _____

Other N.C. residents add $.18 sales tax per calendar _____

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All orders must be prepaid. We do not bill. A $15.00 charge will be made on returned checks (N.C.G.S. 25-3-512).

For fund raising and bulk rate information (10 calendars or more), call 919-733-7380. Please allow 4-6 weeks for delivery.

CALO 89

Kreh's Photography Guide Tops For Outdoorsmen

More and more people are carrying cameras when they venture into the great outdoors, and for good reasons. Sportmen can capture forever that big largemouth bass or that buck with the massive rack. But a camera can also record the memory of a special sunset, wildflowers, nature's creatures, a tranquil swamp, fall foliage or even family members sitting around a campfire. Yet for many outdoorsmen, cameras are puzzling tools that rarely yield the desired results.

Now, however, both novices and experts can get the photos they want thanks to the *L. L. Bean Guide To Outdoor Photography* by Lefty Kreh published in August 1988. Kreh is one of the top outdoor photographers in the country—his articles and photographs have appeared in this magazine and many others—and he has the knack for providing simple, yet accurate information that covers every situation you're likely to encounter.

Types of cameras and lenses, lighting, filters, composition and much more—all tailored to the outdoor photographer, and available in this compact guide that can fit into your backpack.

L. L. Bean Guide To Outdoor Photography by Lefty Kreh. $16.95, hardcover, 202 pages. Published by Random House, Inc., 201 East 50th St., New York, N.Y. 10022. (212-751-2600).

Tall Tales Abound Hunt Clubs Second "Home"

***Home Away From Home:** From the opening of the first hunting season each fall until the last one closes with the waning days of winter, hunting camps like this one are spare time gathering places for many North Carolina sportsmen, especially deer hunters. Cold weather may drive the hunters indoors to the warmth of a fireplace or wood stove, but that just heats up the conversation. If you think a tall tale might be in progress among these hunters in front of Joe Carpenter Sr.'s clubhouse in the Sandhills, you're probably right. Pull up a drink crate and listen.*

Calendar Of Events

On several occasions, events in this calendar have been changed or canceled without notice. Readers should check with the contact listed before traveling to an event.

Dec. 2-3
Annual Appalachian Craft and Music Festival at Appalachian State University in Boone. Traditional mountain crafts demonstration, music and dancing. For more information contact the Center for Appalachian Studies, Appalachian State University, Boone, N.C. 28607 or call 704-262-4089.

Dec. 2-31
Christmas with the Guild at the Folk Art Center in Asheville. Exhibits of quilts and other crafts, dulcimer making and music, and other special demonstrations. For more information contact the Southern Highland Handicraft Guild, P.O. Box 9545, Asheville, N.C. 28815 or call 704-298-7928.

Dec. 3-4
Core Sound Waterfowl Festival at the Harkers Island Elementary School in Harkers Island. Displays of decoys and wildlife carving, waterfowling memorabilia, and auction. For more information contact the Core Sound Decoy Carvers Guild, P.O. Box 308, Harkers Island, N.C. 28531 or call 919-728-7316.

Dec. 11
A Colonial Christmas at the Schiele Museum of Natural History in Gastonia. Observe the customs of an 18th century, backwoods Christmas celebration. For more information contact the Schiele Museum, P.O. Box 953, Gastonia, N.C. 28053 or call 704-865-6131.

Dec. 16-17
Old Salem Christmas at Winston-Salem. Recreation of an 18th-century Moravian Christmas celebration. For more information contact Old Salem, Drawer F, Winston-Salem, N.C. 27108 or call 919-723-3688.

Help Buy Habitat

Bottomland Print Offered

Proceeds from the sale of these prints will be placed in the Nongame and Endangered Wildlife Fund which supports a variety of nongame wildlife projects and the purchase of wildlife habitat in North Carolina. Each poster-sized, numbered print bears the North Carolina State seal, Governor Martin's signature, and the artist's signature.

The Nongame Print makes a great holiday gift. **To receive your print in time for the holiday season, your order must be received by December 9.**

Please send me _____ 1987/88 Nongame and Endangered Wildlife Prints @ $25.00 each $_____

Enclosed is my check for . . . . Total $_____

PLEASE USE STREET ADDRESS FOR DELIVERY

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Phone (_____) _____

Please make check payable to:
N.C. Wildlife Resources Commission

Send order to:
Nongame Print; N.C. Wildlife Resources Commission
512 N. Salisbury St.
Raleigh, N.C. 27611

All orders must be prepaid. We do not bill. A $15.00 charge will be made on returned checks (N.C.G.S. 25-3-512). PLEASE ALLOW 8 WEEKS FOR DELIVERY.

Birds Seek Protection

Hunt Sheltered Areas for Grouse

Many fishermen seek out a lee shore during the stormy months of fall because fishing is easier in protected waters.

Grouse hunters can use the same tactics to find birds. Hunt the protected sides of the ridges where the birds are less exposed to the weather, and in windy areas pay particular attention to old blowdowns. If you're hunting old clearcuts, work the protected edges on the upwind side and check dense brushpiles and blowdowns for birds.

The Wildlife Endowment Fund Report

The Wildlife Endowment Fund is supported by the sale of lifetime licenses, lifetime subscriptions to *Wildlife in North Carolina*, and tax-deductible contributions. Only the annual interest from this fund is used for wildlife conservation, and the fund will play a key role in supporting wildlife programs in the future. Interest is earned through investments made by the State Treasurer's Office. For more information, write to the Wildlife Endowment Fund, N.C. Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, N.C. 27611.

Status on September 30, 1988

	Numbers Sold	Revenue Received
Lifetime Sportsman's License	45,340	$14,387,770.58
Lifetime Hunting License	387	98,479.82
Lifetime Fishing License	3,478	689,898.20
Lifetime Subscriptions to Wildlife in N.C.	1,436	187,347.92
Contributions	—	116,907.27
Fund Total	50,715	$15,480,403.79
Total Interest Earned	$3,375,426.50	

Wildlife in North Carolina—the book!

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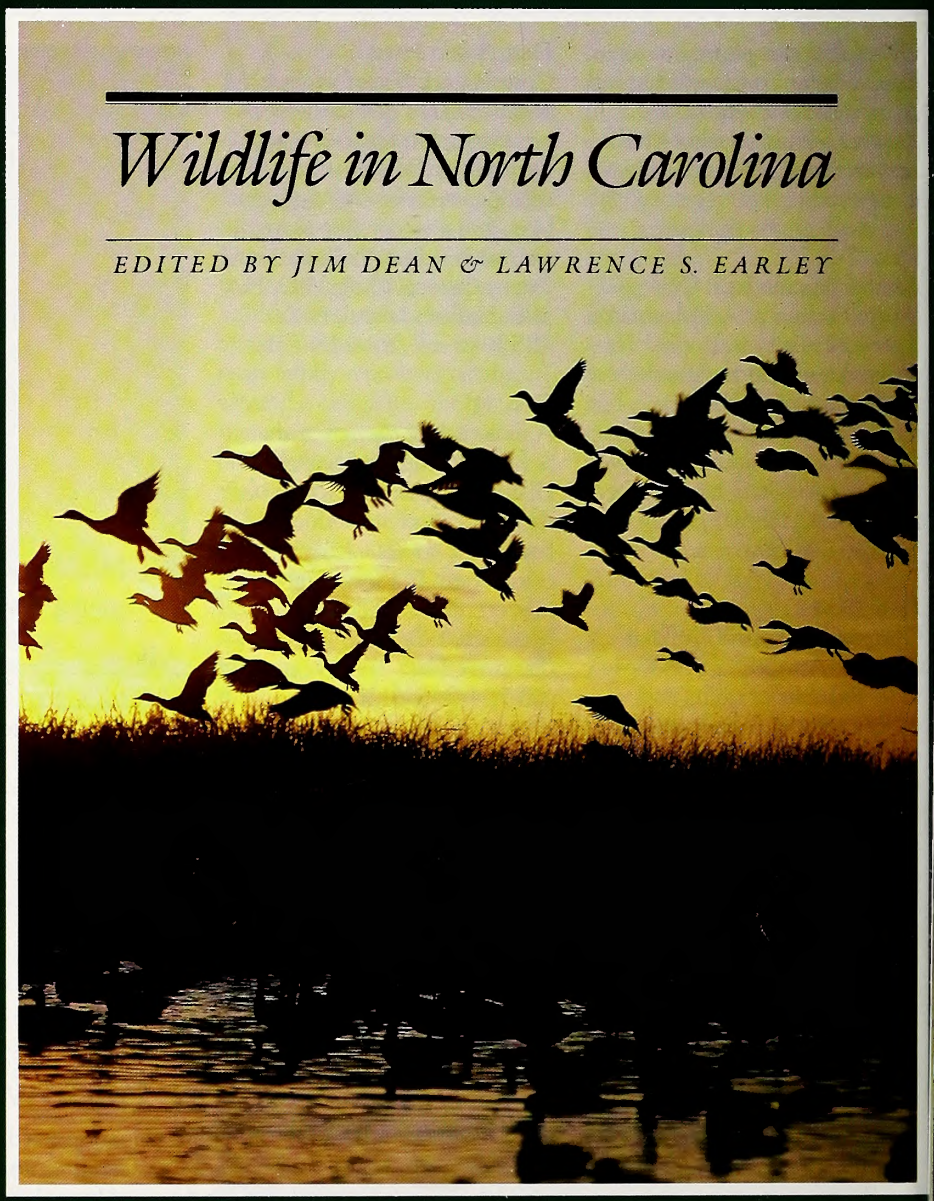
A collection of great outdoor writing and over 100 color photographs. The big book that says it all about the North Carolina outdoors.

Great for the sportsman . . . and the family.

Published by the N.C. Wildlife Resources Commission and the University of North Carolina Press. Hardbound copy is $24.95 at bookstores everywhere. Or order direct using the special order form below.



Book Order Form

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Please ship my copy(ies) of *Wildlife in North Carolina* — "the book" — to:

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Send prepaid order to: University of North Carolina Press, P.O. Box 2288, Chapel Hill, NC 27514.

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Give the holiday gift that lasts a lifetime—a lifetime subscription to *Wildlife In North Carolina* or a lifetime license (see form at left).

At Home Aloft

At home among the bare limbs, a gray squirrel takes advantage of a bright winter day to enjoy a bit of sunlight.

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